This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

THE

EDINBURGH MEDICAL JOURNAL

NUNQUAM ALIUD NATURA, ALIUD SAPIENTIA DICIT.

THE

EDINBURGH MEDICAL JOURNAL

EDITED BY

G. A. GIBSON, M.D., F.R.C.P.Ed.

AND

ALEXIS THOMSON, M.D., F.R.C.S.Ed.

NEW SERIES

VOL. XV

EDINBURGH & LONDON
YOUNG J. PENTLAND
1904

CATALOGUED
AUG 30 1904
E. H. B.

EDINBURGH: PRINTED FOR YOUNG J. PENTLAND, 11 TEVIOT PLACE,
AND 38 WEST SMITHFIELD LONDON, E.C., BY MORRISON AND GIBB LIMITED.

ORIGINAL ARTICLES.

PAGE

CORNER, EDRED M., Thrombosis and Acute Gangrene in Strangulated Herniæ 393

COWAN, JOHN M., The Cardiac Muscle. (Plates IV.-VI.) 127

CUMMING, ROBERT, and JAMES M. BEATTIE, Lacerated Wound of the Heart. (Plate XI.) 451

DRESER, On the Diuresis produced by Theocin in Healthy Persons. (Twelve Figures in the Text) 137

DUNCAN, ANDREW, The Stools of Dysentery and the Prognostic Indications derivable from them 349

EYRE, J. W. H., A Comparative Study of the Bacilli of Dysentery . . 489

JONES, R. LLEWELYN, Types of Rheumatoid Arthritis, with Suggestions as to Thyroid Treatment 425

KING, D. BARTY, The Treatment of Bronchiectasis 519

KYNOCH, J. A. C., A Case of Cæsarean Section for Contracted Pelvis . 448

LANE, W. ARBUTHNOT, On the Treatment of Cleft Palate. (Seven Figures in the Text) 216

MACPHERSON, JOHN, Variation in its Relation to the Origin of Insanity and the Allied Neuroses. (Three Tables and Three Charts in the Text) 334, 416, 529

MILES, ALEXANDER, Bennett's Fracture of the Base of the Metacarpal Bone of the Thumb. (Plates VII. and VIII.) 297

MILES, ALEXANDER, Notes of a Case of Traumatic Hæmatorrachis of the Upper Dorsal Region 155

MORISON, ALEXANDER, The Neural Factor in Heart Disease . . . 235

MORISON, RUTHERFORD, Abdominal and Pelvic Surgery. (Seven Figures in the Text) 21

MORISON, RUTHERFORD, Hernia. (Plates IX. and X.) . . 203, 308

RANKIN, GUTHRIE, Arterial Degeneration 402

RITCHIE, W. T., On the Etiology of Fibrinous Bronchitis. (Plate III. and Two Figures in the Text) 117

PAGE

ROBERTSON, JOHN ALEXANDER, Cape Colony as a Health Resort for those suffering from Pulmonary Phthisis, with special reference to the Graded Altitude System 434

RORIE, DAVID, Some Fifeshire Folk-Medicine 513

SHAW, T. CLAYE, The Collegiate Training of Women . . . 444

STEWART, WILLIAM, Notes of a Case of Hæmorrhagic Pericarditis associated with the Presence of Bacillus Coli Communis ; Paracentesis ; Recovery . 158

STOCKMAN, RALPH, The Causes, Pathology, and Treatment of Chronic Rheumatism. (Plates I. and II.) 107, 223

TAYLOR, FRANK E., The Association of Ovarian with Uterine Fibro-myomata 506

TUKE, SIR JOHN BATTY, and CHARLES R. A. HOWDEN, The Relations of the Insanities to Criminal Responsibility and Civil Capacity 11, 146, 244, 325, 409

TURNER, A. LOGAN, A Contribution to the Pathology of "Bone Cysts" in the Accessory Sinuses of the Nose: Concluded from Vol. xiv. p. 526. (Two Figures in the Text) 47

WEBER, F. PARKES, A Note on Cutaneous Telangiectases and their Etiology : Comparison with the Etiology of Hæmorrhoids and Ordinary Varicose Veins 346

THE

EDINBURGH MEDICAL JOURNAL.

8233

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

Dr. Brudenell Carter and the Profession.

It is good for all of us that, from time to time, some man of experience and large vision should step out from the busy bazaar of life, and from a more detached platform remind us of eternal truths. The mere fact that these truths are more than the expressions of contemporary thought, need not bring a charge of want of originality, and Dr. Brudenell Carter in his recently published "Doctors and their Work" would be the last person to claim the vision of the seer. His message to us is serious and potent enough in that it deals primarily with the question of intellectual morality, a form of ethical sanity that is too apt to be overlooked in an age of shifting dogma and fleeting hypothesis. Dr. Carter approaches the profession in no dictatorial and ecclesiastical spirit. He preaches no gospel of perfection from a pulpit of unctuous rectitude. He is content to remind the busy journeyman of the profession, that there is a truth beyond contemporary judgment, and a light beyond the light of setting suns. No man can rise from the perusal of his dignified and artistic deliverance without a sense of having breathed for a time the rarefied atmosphere of disinterested truth, and without an inspiration at least to strive after a higher conception of intellectual life. It is as well that Dr. Carter should remind us that the love of truth is not merely a moral instinct, but "pre-eminently a result of careful mental training." In all he writes, the author is invariably happy in his capacity for phrase making. "It is characteristic of the philosopher to love truth better than his hypothesis." "It will be impossible not to perceive how much more active is the desire to know what is said, than the desire to know what is true." "The confusion which frequently exists between accurate descriptions of events, and erroneous conjectures about the causes to which these events should be ascribed." "A case of illness is a problem to be solved rather than a condition to be altered." "The first duty of the practitioner is to learn that, behind the sickness, there is the sick man, and that no two sick men are alike." The volume before us teems with sane observations, which, despite their universality in truth, possess a dignity of application which excludes them from the category of the platitude. Dr. Carter discusses the aims of medicine, the hindrances to medicine, and many other questions of import to the man who takes his profession at a high level of dignity and responsibility. Perhaps the chapter "The Wishes of the Patient" is most to the point, and lucidly defines the attitude of the public towards the healer, and suggests the best position to be assumed by the healer towards the public. Nothing could be truer than the fact that "the patient, as a rule, has but slender comprehension of the aims of medicine, and is therefore little likely to be in sympathy with them." "A headache to him is what the primrose was to Wordsworth's hero," "he regards the doctor chiefly as an agent, whose business it is to remove this headache, and who, if he be of competent skill, will remove it without delay, and without insisting upon any tiresome conditions, or upon any inconvenient sacrifices." The chapter on the "Hindrances to Medicine" ought to be largely quoted by the lay press. It is a scathing and powerful attack on the "Antis," and a dignified and eloquent defence of the scientific position. Dr. Carter's definition of "Anti"-ism as "the profession of convictions differing from those which are founded upon the knowledge of experts" is comprehensive and final, and no objection can be taken to his contention that "anti-ists" have "disgraced themselves morally by the continual repetition of statements which have continually been proved to be false." Comparing what is denounced in vivisection with what is accepted as reasonable in the ordinary run of life, the following analogy seems not inappropriate:—"Few would dispute that a horse may properly be pushed to the full measure of his powers, or ridden until he drops dead, in order to procure help for human beings who are exposed to mortal perils from fire, from shipwreck, or from criminal violence. Few would deny that a dog may be properly urged, in defence of his master, to encounter an adversary of greatly superior power, and to engage in a contest which can have only one issue." This analogy is more than mere sophistry, it gets to the root of the whole matter, which is, that "it is legitimate to inflict pain or death upon sentient beings, not excepting mankind, for the attainment of adequate ends, and it is not legitimate to inflict pain or death for the attainment of inadequate ends." Dr. Carter has a valuable chapter on quacks, and incidentally contends that "it is an open question, whether the sellers of any quack medicine, if an analysis of its composition were contrasted with the claims put forward on its behalf, might not be successfully prosecuted for obtaining money under false pretences." It seems to us that the days are ripe for such a prosecution, in the cases of certain drugs which are vaunted as being capable of curing every disease from housemaid's knee to paralysis, and from Bright's disease to sterility. The vexed question of professional reticence is discussed with ease and proportion, and inspires the excellent statement that "the only safe rule is to refuse all information about an illness to third persons, unless with the previously obtained consent of the patient, given either in writing or before a credible witness." Through all he writes, there is a spirit of high love for sanity and truth, and a lofty ideal of professional morality. The dangers of empiricism and superstition, of the idolatry of hypotheses, of commercialism, and blatant volubility, are dealt with in a spirit of conviction and earnestness that ought to be an inspiration and a warning to the busy practitioner, who has perhaps too little time to "turn from the songs of modern speech and see the stars." Dr. Carter's book might have been greater if it had been free from a certain academic pedantry, and from a tendency to parochialism. London to him is the hub of the universe, and all other focusses of learning, merely provincial centres. His parochialism often lands him in the grossest inaccuracies, which irritate so much as to discount the usual wisdom of the man. Dr. Carter is too apt to attribute base motives, which is a sad procedure in a philosopher. What are we to say to the following?—"When the Bill for opening England to Scottish and Irish graduates was before Parliament, grave fears were expressed lest it should lead to a competition downwards among Scottish and Irish examining bodies, struggling with each other for the fees of English students." These fears still exist in the view of our author. Again, "The only effective means . . . is an abolition of the system under which nineteen different bodies *compete* for the fees of licentiates." This uncharitable attitude is not worthy of Dr. Carter, nor was it wise of him to gravely make the statement that "during the first half of the century, the stamp of the Scottish doctorate was chiefly sought by a class of English students, who were not manifestly likely to become highly distinguished by reason of their own superior merits or attainments." In discussing the question of "Doctors and the Insane," Dr. Carter is also guilty of many extreme statements. "Medical superintendence, as far as any progress in the direction of increased knowledge of the actual causes of insanity is concerned, must be regarded as wholly ineffective." "Our knowledge of the causes is scarcely greater now than it was a hundred years ago," and so on, and so on; this whole chapter being only saved from utter condemnation by one humorous paragraph relating to lay managing committees. "The application of the kitchen waste to the support of an increased number of pigs, would make a far greater impression upon the minds of the committee than the most brilliant discovery with regard to the functions or the nutrition of a nerve cell." But despite the obvious blemishes in the book, we can safely herald it as a masterly contribution to the non-technical literature of the profession. Dr. Carter possesses more than the spirit of a philosopher, he has the gifts of a distinguished stylist in letters. To all his qualities, he adds that of being an enthusiast, not for hasty doctrines or plausible assumptions, not for the idle acceptance of that destiny of life which seems easiest and most promising of reward, but for the pursuit of truth in its highest form, and the upholding of a great profession on the shoulders of great endeavour. He need not trouble himself as to the fact that the profession has lost its power and respect in the estimation of the public. A democratic age has destroyed mere idolatry, that is all, and so long as each man individually be worthy of respect and consideration, no man need fear the stability of the whole as a body scientific and politic.

Bayliss *v.* Coleridge.

Guilty of libel! Damages, £2000! "The Law allows it and the court awards it." Even the *Sun*, most rabid of antivivisectionist sheets, cannot but admit that a British jury, directed by one whom all concede to be a " wise and upright judge," could arrive at no other verdict with the evidence before it. The applause with which the result of the trial was greeted in Court has been echoed in every respectable journal throughout the kingdom.

Let us consider what exactly the trial and its issue mean. For years this agitation has been proceeding; an agitation against scientific experiments upon the lower animals; conducted by more than one society; with paid and unpaid officials, with missioners and lecturers, leaflets, diagrams, and magic lanterns; supported by dukes and duchesses, bishops and clergy of all denominations, by all sorts and conditions of men and women,—with the exception of those who are accustomed to enquire for themselves into the truth or falsehood of statements laid before them. Far be it from us to doubt that in very many cases the driving motive of the supporters of this agitation has been one of the noblest of sentiments which can actuate humanity—and least of all would we desire to make an exception of the defendant in this action. The Hon. Stephen Coleridge, son of the late Lord Chief Justice of England, has for a long time been the leading spirit in a Society which claims to act with moderation, to aim not at the total abolition, but at the regulation of vivisection, which deprecates undue violence of language, which professes to issue no statements which are incapable of proof, although it would be a liberal admission to say that it has always or even habitually acted up to that profession. But in order to have a *raison d'être*, it is requisite for this Society to prove the necessity for further regulation than that provided by the existing Act (which was passed nearly thirty years ago as the result of the report of the Royal Commission on Experiments upon Animals), and for this purpose evidence must be obtained—evidence which will satisfy a court of law—not the irresponsible hearsay evidence which persons who are entirely controlled by sentiment are ready to accept—evidence that operations which are wholly unnecessary, and which can lead to the acquirement of no useful knowledge, are performed habitually, or frequently, or even only occasionally, upon animals which are not anæsthetised, and which are therefore capable of feeling pain. It is not too much to say that it must from the first have been one of the main objects of Mr. Coleridge to produce such evidence, since without it the case of his Society must fail; it can have no reason for further existence; it must leave the field to those who, in defiance of common sense and common knowledge, deny both the right of man to employ the lower creation for his own benefit, and the possibility of medicine being in any way advanced by experiments upon animals. Here in the case of Bayliss *v.* Coleridge, we see the result of this long endeavour, extending over a period of many years. "At last," thinks Mr. Coleridge, "we have got the evidence which has been lacking to us, and in pursuit of which we have expended so much energy, so much time and money, so much printer's ink, so much" (we regret to have to add) vituperation. "Here is an indubitable case, supported by two eye-witnesses," whose integrity is so apparent, that in Mr. Coleridge's opinion there can be no necessity for any independent enquiry into the truth or falsehood of the statements which they make. Is this because they are also honorary secretaries of an Antivivisection Society? Strange that any man, gifted as Mr. Coleridge must be with a hereditary store of legal acumen, should not have considered the element of bias. Things that his witnesses have gone determined to see, they see clearly—even although they do not exist: facts that are obvious to every one else they are blind to. Is it possible to suppose that, if scenes really were enacted in physiological and pathological laboratories of the kind alleged by Mr. Coleridge, he would have met with any difficulty in proving his case up to the hilt long ago? The work of these laboratories is not conducted in secret; they are open to any one interested in the subject; the inspectors pay their visits unannounced; students, who may themselves, like the witnesses who reported Dr. Bayliss's experiment to Mr. Coleridge, cherish antivivisectionist sentiments, are not excluded. The only conclusion that can legitimately be drawn from Mr. Coleridge's failure is that the allegations his Society has been scattering broadcast are not true, that the right of experiment upon animals is not abused, that there is no case for further restriction, that the safeguards against cruelty which are provided under the present Act are sufficient and efficient. Is it not time that the assistance, pecuniary and other, which has been so fruitlessly lavished in support of this Society should be withdrawn? Surely the complete failure which has attended all Mr. Coleridge's efforts to establish the truth of his allegations, a failure which has culminated in this verdict, ought to be accepted by all thinking persons, however noble may be the sentiments which have actuated them, as a proof that the existence of his Society is not justifiable. This is the moral which the verdict in Bayliss *v.* Coleridge seems to point.

Herbert Spencer (1820-1903).

The death of Herbert Spencer in his eighty-third year seems like the fall of a giant oak in the forest, leaving a huge gap, but neither unexpected nor, as things are, regrettable. The grasshopper was beginning to be a burden to him, and he had completed the great task of his life,—greater than most men have even dreamed of,—that of applying the evolution formula to everything knowable. He has influenced thought so largely, inspired so many disciples, and left so many enduring works,—each as much a seed-plot as an achievement,—that his death, writ large, spells immortality. In his works, his disciples, his influence, he is so much still with us, that in spite of the great gap which his death makes, he will not be much missed until the time for another generalising genius arrives. As it seems to us, this is the highest eulogy which could be pronounced at the close of a great life.

This is not an appropriate place for more than a reference to Herbert Spencer's life, which was signalised by its absolute consecration to the pursuit of truth, by its magnificent disinterestedness as to fame and reward, and by its resolute—characteristically scientific—struggle against ill-health. With another constitution, a man of his great gifts might have set the world aflame, but his energy was rarely, if ever, more than luminiferous. He did not strive like Huxley, nor cry like Nietsche, nor cause his voice to be heard in the streets like Gladstone: he was, like Darwin, a quiet servant of science, disliking controversy, sensationalism, and noise, trusting to the power of truth alone, that it must prevail. All through his life of plain living and high thinking (the latter condensed in expression to about three hours a day), he was vexed by an extremely nervous temperament, the nemesis of which he successfully baffled, time after time, by periods of rest and play, angling in the Highlands or playing billiards at the Athenæum. He was almost quaintly physiological in his intellectual hygiene, as when he used to pause in his work and row hard for a few minutes to adjust the requisite cerebral circulation. From another point of view, he was like a true artist, never working except when "in good form." Of course, this implies that, notwithstanding his personal sacrifices in the publication of his works, he was, on the whole, like Darwin, little worried by the commonplaceness of having to be careful "to make ends meet." As we have said, he had a nervous temperament, and it seems probable that his normal psychoses were many times more intense and extensive than those of ordinary intellectual combatants. Mr. Francis Galton has graphically stated his impression, that Spencer's composite mental photograph, in forming a generalisation, or in using a general formula-term, were many times multiple of those of ordinary mortals. A composite mental photograph from a small number of intellectual negatives yields a blurred outline,—a woolly idea, with ragged edges and loose ends,—but a composite mental photograph from a very large number of impressions yielded, in Spencer's case, a generalisation which was crisp and well-defined. Some one has said that Ruskin had the most analytic mind in modern Christendom: that Spencer had one of the most synthetic minds can hardly be questioned.

In this place we are naturally most concerned with what Spencer did for science, and it is not difficult to indicate in a general way what his services were. 1. In the first place, he was one of the strongest pioneers of the Evolution Idea, which has now become almost organic in all our thinking. In his first important book (1850), "Social Statics, or the Conditions essential to Human Happiness specified, and the first of them developed," there are two or three sentences in which "may be seen the first step toward the general doctrine of Evolution." As far back as 1852, in an article in the *Leader* on the "Development Hypothesis," Spencer stated his conviction that the supporters of this view "can show there *is* at work a modifying influence . . . which does in time produce marked changes . . . which, to all appearance, would produce in the millions of years and, under the great varieties of condition which geological records imply, any amount of change." In his essay on the "Nebular Hypothesis," which appeared in the *Westminster Review* of July 1858, before the famous couple of papers by Darwin and Wallace, he clearly stated the general idea of evolution as a modal formula applicable to the world as a whole. He was an out-and-out evolutionist before the publication of the "Origin of Species," 1859, and must be ranked in the long list of pioneers—such as Lucretius, Buffon, Erasmus Darwin, Lamarck, Goethe, Treviranus, Etienne Geoffroy Saint-Hilaire, and Robert Chambers—who link Charles Darwin to the Greeks. It is not altogether easy to say how it was that Spencer got such a firm grip of the Evolution idea before Darwin won the conviction of almost all except the prejudiced by his magistral marshalling of the evidences, but he has himself indicated that he was greatly impressed by Von Baer's views on individual development. On the whole, however, he came to the theory of organic evolution from above rather than from below, from his studies on the intellectual and social evolution of man rather than from acquaintance with the biological data.

2. Having formulated the Evolution idea, Spencer proceeded to bring it into rational relation with the great physical generalisa-

tions of the conservation and transformation of energy. The thinker who had collected flowers and insects as a boy, to whom the progress of humanity had become the supreme problem, had also been for many years an engineer, familiar with the concepts which Joule, Colding, and Helmholtz had established in regard to "the persistence of force," or the conservation of energy. In the magnificent philosophical system which was taking shape in his mind, the evolution-formula, reached inductively, could not find a place until it was shown to be rationally deducible from the concept of the persistence of force. And this Spencer effected in a manner which he who runs cannot hope to read, luminous as the argument almost always is. To read Spencer may be difficult, for the problems are difficult, but the charge of obscurity is fatuous, as his popularity in France, where lucidity of style has reached its high-water mark, is sufficient to show. The outcome was his familiar formula of evolution:—"Evolution is an integration of matter and concomitant dissipation of motion, during which the matter passes from an indefinite incoherent homogeneity to a definite coherent heterogeneity; and during which the retained motion undergoes a parallel transformation."

3. Having incorporated the evolution idea as a deductively as well as inductively secure keystone of his system, Spencer continued, as all the world knows, to apply the concept to every order of phenomena from nebulæ to religions. Omitting any detailed treatment of inorganic evolution (for which the time was not and is not ripe), he summed up the evidences of organic evolution in a way which seems to a certain type of mind even more convincing than Darwin's method. He went on from the body to the soul, and sought to decipher the steps in the evolution of mind from reflex action, with its primitive element of consciousness. Leaning hard on the biological concept of heredity, he made the transition from the animal to the social organism, tracing the genesis of ideas and ideals, customs and conventions, institutions and religions, until his work was done. In his essay on "Progress: Its Law and Cause," he gives in simple language the gist of his Synthetic Philosophy:—

"We believe we have shown beyond question that that which the German physiologists (Von Baer, Wolff, and others) have found to be the law of organic development (as of a seed into a tree, and of an egg into an animal) is the law of all development. The advance from the simple to the complex, through a process of successive differentiations (*i.e.* the appearance of differences in the parts of a seemingly like substance) is seen alike in the earliest changes of the Universe to which we can reason our way back, and in the earlier changes which we can inductively establish; it is seen in the geologic and climatic evolution of the Earth, and of every single organism on its surface; it is seen in the evolution of Humanity, whether contemplated in the civilised individual or in the aggregation of races; it is seen in the evolution of Society in respect alike of its political, its religious, and its economical organisation; and it is seen in the evolution of all those endless concrete and abstract products of human activity which constitute the environment of our daily life. From the remotest past which Science can fathom, up to the novelties of yesterday, that in which Progress essentially consists, is the transformation of the homogeneous into the heterogeneous."

If there is any book that will save a man from being easy-going in regard to biology, it is Spencer's "Principles of Biology." It is a biological classic, which, in its range and intensity, finds no parallel except in Hæckel's greatest and least known work, the "Generelle Morphologie," which was published about the same time as the Principles. To speak of "The Principles of Biology" without apparent exaggeration is difficult. As one of our foremost biologists has said: "What strikes one most forcibly is the extraordinary range and grasp of its author, the piercing keenness of his eye for essentials, his fertility in invention, and the bold sweep of his logical method. In these days of increasingly straitened specialism, it is well that we should feel the influence of a thinker whose powers of generalisation have seldom been equalled and perhaps never surpassed." The great work was much more than a careful balance-sheet of the facts of life—not that this was little, it meant orientation and systematisation, it was the introduction of order, clearness, breadth of view, and gave biology a new start. It displayed the facts of life and the inductions from these for the first time clearly in the light of evolution. If the evolution idea is an adequate modal formula of the great process of Becoming, then we need to think of growth, development, differentiation, integration, reproduction, heredity, death—all the big facts—in the light of this. And this is what the "Principles of Biology" helps us to do. It is of course saturated with the theory of the transmissibility of acquired characters,—an idea integral to much of Spencer's thinking,—which had hardly begun to be questioned when the work was published; which is now, however, a very moot point indeed. For this and other reasons, we are inclined to doubt the wisdom of the re-edition, which, to be frank, is not so satisfactory for 1898 as the original was for 1864.

While there is unanimous appreciation of the splendid ability of Spencer's life-work, there is an interesting diversity of opinion as to its lasting value. There are philosophers who declare that Spencer may have been a great man of science, but that he was not in the running in philosophy—this being said quite seriously of the author of the most elaborately complete synthesis that the world has yet seen! There are scientists who say that Spencer may have been a great philosopher, but that he was too much given to deductive methods and *a priori* reasoning to be of great account in science—this being said quite seriously of the author of "First Principles," "Principles of Biology," and "Principles of Psychology"! And there are others, neither philosophers nor scientists, who are content to dismiss Spencer with saying that the least in the Kingdom of Heaven is greater than he. In all of which there is doubtless some justice, for Spencer was at no pains to relate his philosophy to other systems, and assumed without qualm what have seemed to some to constitute the ultimate problems of experience; there are passages in his "Principles" which strike us as more like science ground from a logical machine than as a formulation of the actual data of life; and there is no doubt that much that he wrote reads like a commentary on the old text, "Though a wise man think to know the work of God, yet shall he not be able to find it."

This much will be conceded by all, that Herbert Spencer took the evolution formula into his strong hands as a master-key, and tried (teaching us to try) to open therewith all the locked doors of the universe—all the immediate, though none of the ultimate riddles, physical and biological, psychological and ethical, social and religious. He always postulated, however, an "unknowable power," an absolute existence, and in the recognition of this as inscrutable he hoped to see a reconciliation of Science and Religion. The religious consciousness has not as yet found much satisfaction in Spencer's altar to the unknown, unknowable God; we wait for another St. Paul—or perhaps a St. Thomas—to do it justice, to make its solemn vagueness the centre of a new fane.

ORIGINAL COMMUNICATIONS.

THE RELATIONS OF THE INSANITIES TO CRIMINAL RESPONSIBILITY AND CIVIL CAPACITY.[1]

By Sir John Batty Tuke, M.P., M.D., F.R.C.P. Ed.; and
Charles R. A. Howden, M.A., *Advocate*.

I. Introductory.

The application of law to the individual case presupposes the existence of a normal personality in view of which the laws arise. Wherever the elements of that personality are suspended or modified, justice requires a corresponding suspension or modification of the law. In every case, therefore, to which we apply the ordinary rules of law, we assume the existence of the ordinary mental functions and their uninterrupted development up to a period of life at which we presume the individual to have learned to appreciate sufficiently his relations to others, and to have acquired sufficient power to regulate his acts by his experience. When these conditions are absent or notably imperfect, or when they are for the time in abeyance, the law has ever refused to permit the exercise of rights and has abstained from imposing responsibility for crime. The individual is subjected to new rules, and his acts lose their ordinary legal significance.

The cases in which the law is thus suspended by abnormal conditions of the mental functions depend almost wholly on conditions of disease; and as these fall peculiarly within the province of medicine, it plainly belongs to that science to investigate the nature and extent of these aberrations. The subject from this point of view is a branch of forensic medicine in which the results of medical science are arranged for the information of the lawyer, with only so much scientific theory and proof as is necessary to enable him to judge of the application of the general principles to the individual case.

The relation of insanity to law thus falls to be dealt with from two different standpoints. The subject belongs to forensic medicine in so far as its material is necessarily derived from the scientific knowledge of disease and its effects on the mind; but when once this material is obtained, its further use is matter for law. It belongs to law to define the conditions of normal human personality and the grounds on which exceptions can be admitted to it; and in the event of medicine being able to afford no very certain psychological information, it belongs to law also to determine the nature of the presumptions and the nature of the proof to be admitted.

---

[1] The notes which form the basis of this article and the following series of papers were compiled by myself and the late Alexnader Gibson, M.A., advocate, working in close association. When my friend died in 1887, I lost heart in the work, because I felt that the leading light which had guided our consultations had suddenly been extinguished. No one will wonder at my feelings who knows what the loss of that bright and faithful spirit meant to his friends.

During the last few months I have taken up the materials which had then been laid aside. Thinking that they might be found to contain some points of interest, I submitted them to the editors of the *Edinburgh Medical Journal*, who approved of their publication. In the work of re-arrangement, and still more in furnishing a supplement, rendered necessary by the lapse of time, to the chapters bearing immediately on the theory and practice of law, I have been fortunate enough to secure the co-operation of Mr. Charles R. A. Howden, M.A., advocate.—J. B. T.

Although in theory the provinces of law and medicine are thus distinct, great confusion between them has arisen in practice. This state of matters has arisen partly from difficulties inherent in the subject, which we can never hope entirely to overcome; but in part also it is due to the persistence of traditional views of insanity and to the recent development and still imperfect condition of medical knowledge. The best clue to these adventitious difficulties may be found by glancing briefly at their history.

In the earlier stages of law and medicine, cases of insanity were regarded merely as outstanding exceptions from humanity, measured and defined by the popular judgment, and not intelligible except upon strange hypotheses. It followed as a necessary consequence, that no cases ever came within the view of either science which were not extreme. Madmen were regarded as an exceptional class cut off from the rest of mankind, it mattered not whether by demoniac possession or by inexplicable fate. The subtle and doubtful cases which perplex our modern judgment were unheard of, because even a slender proof of reason was enough to exclude them from a group which was conceived as standing in utter isolation. The monstrous moral phenomena which would now suggest the action of disease were regarded as springing from a deeper than ordinary depravity. At such a stage as this there could be no conflict between the two sciences, because neither had a standard or definition of its own. Both alike used terms which bore the stamp of popular coinage, and their treatment of the cases thus ascertained was as rude as their mode of definition.

In law, the first traces of modification of the old rude views appear in the writings of the Canonists, the exponents of Ecclesiastical Law. The subjective point of view which was prominent in the Canon Law naturally led to a more careful consideration of the mental conditions, and the result is that in the works of many prominent writers of that school we find the effect of insanity considered with a care and discrimination which remained long unknown to the more familiar criminal systems of Europe. The less extreme forms of insanity are recognised as a mitigation, if not as a complete bar to punishment; the difficulty of proof and the danger of punishing persons really insane is evidently strongly felt; the value of medical evidence is recognised, and cases are referred to medical experts.

The writers to whom we refer had, however, little influence over the great systems of criminal laws, and especially little over that of England. The institutional writers who determined the forms and terminology of the Common Law drew their phrases and ideas either from popular sources or from the Roman Law, and the latter was itself popular in its phraseology. Hence in the earlier law books we find words to which no very definite meaning can be attached, and which are explained only by crude illustrations of extreme cases. When, however, the law began to assume a more systematic form, and especially when attempts were made to put it on a philosophical basis, it inevitably resulted that the old language and illustrations were supplemented by a more precise statement of the mental defect. Instead of curious examples of mad actions, we find a definition of the mental faculties on which alone free action was supposed to depend, and we reach a stage at which men began to discuss the foundations of legal responsibility and capacity, and felt it necessary to say precisely what were the essential points of deficiency in the case of madmen. The supposed characteristics of madmen are brought into direct comparison with the conditions of responsibility: Hale, for example, first states the latter, and then shows how they are negatived by insanity. Of course, in many instances, the sharp lines of the leading authorities were modified and became obscure in the hands of ordinary judges; but still it tended to settle into a distinct rule of law, that insanity was no longer to be considered as a concrete condition, but was to be analysed and brought into immediate comparison with the conditions of responsibility. Even when the old terms were not formally replaced by a psychological definition of this kind, the same result was attained by the influence of legal traditional authority; and it may be said in general terms that, during the 18th century, every criminal system in Europe had settled more or less precisely on what grounds insane persons were irresponsible, and demanded evidence, not merely of insanity, but of the actual existence of those grounds in the particular case.

The result of this change was important and in some ways mischievous. Medical science was in no position to exercise any influence, and lawyers had little practical acquaintance with insanity. The view taken of its mental features and its relations to responsibility was therefore naturally imperfect and largely determined by the current psychology and metaphysics. From metaphysics came the assumption of free will, which in one shape or other lies at the basis of all criminal jurisprudence. From psychology came, not merely a sharp division of the intellectual from the other mental functions, but also an exaltation of the former into almost exclusive prominence. Hence the conception which lay at the base of theories of legal responsibility was of a will isolated and independent, entirely capable of following the intellect, and therefore, when properly informed, self-controlling and responsible. The practical working of these theories, which entirely coincided with the popular view, appears clearly in the older cases. It was enough to prove that intelligence existed; or, to state it more strictly, intelligence was assumed, in the absence of positive proof that it was absent. In that case the influence of insanity, however strong and clearly marked, was no more taken into account than the defects and passions of the sane nature. It seemed to the courts that every one who had any power of reasoning left to him could control himself if he pleased, and ought to be punished if he did wrong. Nor did views like these admit the less sharply marked forms of insanity as a ground for mitigating punishment. If the intelligence were sufficient to enlighten the will on the comparatively simple subject of crime and its punishment, the full extent of responsibility appeared to be reached. The law made no endeavour to estimate the strength of resistance when resistance seemed possible at all, but was rather led by the strong deterrent theory which really governed it, to keep the check of punishment in fullest severity when the power of resistance was least or altogether lost.

The views of medicine on the subject of insanity remained practically unchanged up to the end of the 18th century; with a few scattered exceptions its treatment was scholastic in character and indicated no real grasp of its nature; names and stock examples were repeated from one book to another, and the actual observation of madmen was on a level with their management and treatment. Indeed, although its character as a symptom of disease was pretty generally recognised, the recognition was accompanied by the feeling that it differed in some mysterious way from all other diseases.

The first real advance was chiefly due to Pinel, and was prompted and aided partly by the spirit of scientific medicine, and partly by the more humane views of general society. Pinel and his school were the first to study the insane in a systematic manner; and the result of their observations was, not merely that they differed much from each other in the kind and degree of their insanity, but that in some ways they did not differ so much from the sane as had been generally supposed. Beyond this lay a further stage. When once insanity was critically examined, not only did differences appear among the old recognised classes of madmen, but the resemblance to other cases, which had hitherto passed under the names of eccentricity, folly, or crime, became apparent. The further this examination was pushed into the more obscure and less striking features, the wider became the field of insanity, and the narrower the boundary between it and sanity. In a loose and popular way, these analogies had often been used before, but more with reference to some philosophical theory, or as a mere form of expression, than as indicating any sense of a really common basis. Thus Hale readily admits the existence of partial insanity, but wholly neutralises the value of the admission by adding, that "doubtless most persons who are felons of themselves, or others, are under a degree of partial insanity when they commit these offences." The reference is partly suggested by ethical theory, partly by vague general resemblance, but does not in the least mean that he perceived any character in these outlying cases, which connected them clearly with admitted cases of insanity, and distinguished them from the sane world of crime. But the connection between all cases which were entitled to be called insanity assumed a new and definite form, when once the idea that every one of them rested on the basis of physical disease came into prominence. The cases claimed by Esquirol and Pritchard as true insanity would have had no significance, had it not been for the assumption that they were all the result of physical disease or degeneration, and were therefore to be distinguished from types of folly or depravity to which they bore some external resemblance. The difference claimed for them lay not merely in their origin. It was asserted with increasing confidence, not only that such cases arose from physical disease, but that their mental features, while having an outward likeness to those of sane men, did really differ from these in a manner and to an extent which could only be understood by those who made them their special study.

At this stage a conflict between law and medicine was inevitable. Medico-legal writers naturally took up the subject as one peculiarly their own, and whenever medical men appeared as witnesses the newer views of insanity were advanced, and were pressed to the utmost in favour of the accused. The position, however, in which they found themselves was a very difficult one. They were persuaded by their experience that men who stood in a different position from ordinary criminals, were being judged according to the ordinary rules; but they were confronted by a state of things which could not be easily changed. The law had laid down with precision the mental conditions which avoided responsibility, and in doing this, a conception of insanity really imaginary, but shaped after the pattern of current philosophy, and harmonising in substance with the popular view, had either attained the rank of a legal principle, or was at least protected by long settled legal tradition. The witness was merely asked whether the particular case presented some extreme intellectual deficiencies, and the answer was nearly always wide of the mark. The witness had really come to testify to matters which were strictly speaking irrelevant; to explain that in his view the accused was irresponsible, but on grounds which were not recognised by law. Nor were the courts generally disposed to attach much weight to medical testimony even within the limits thus laid down. The general admission, that insanity was properly the subject of medical study and treatment, made it impossible to deny them altogether the position of experts; but it was difficult to bring their authority to bear satisfactorily on any particular case. The position taken up by the law involved a mental analysis which, if possible at any time, did not lie specially within their sphere; and whenever they were led into discussions of this kind, they were apt to be entangled in metaphysical and psychological questions, in which the lawyers were at least as much at home as they were. The practical question in most of the older cases was not so much the mere existence of insanity, as the manner and extent to which it had affected the mind; and this question the courts were apt to think could only be solved by evidence of conduct and character, which was quite as intelligible to the ordinary observer as to the physician. They worked, indeed, very much on the supposition, that in order to appreciate the effects of insanity special knowledge was unnecessary. We repeatedly find judges telling juries that they were quite as competent to determine the question as the medical witnesses, or, in other words, that their knowledge of ordinary sane human nature was quite enough to enable them to interpret correctly the phenomena of insanity.

In order, therefore, to obtain any real influence in the courts, the physician had to show that he occupied a wholly different position. It had to be proved that just as in cases of ordinary bodily disease, the external appearances of insanity were to him symptoms from which he could infer more than the court or jury; that in each particular instance his knowledge of similar cases, and of their causation, made him a more trustworthy exponent of the mental conditions in a given case than those who were obliged to take simply what lay on the surface.

This, however, was not an easy matter, and the difficulty becomes apparent if we consider that we accept the authority of the physician in any case of bodily disease—not because he merely knows it to be a case of disease, but because he knows it by the symptoms to be some particular disease, about which he can tell us a great deal more than could be directly inferred from the appearances presented in that individual case. But the medical knowledge of insanity during at least the greater part of the nineteenth century, did not put him in any such position. All physicians were agreed (with exceptions scarcely worth mentioning) that insanity arose from morbid bodily conditions; yet no one knew, much less could prove, what these conditions were. Hence the only means of classifying the mass of collected cases was by the prominent mental characters of excitement, depression, or obfuscation; and so far as this was done by the great scientific leaders, it was not only necessary but desirable as a preliminary step. The terms indicating the forms of insanity, however—

Mania, Melancholia, and Dementia—were based upon mere external resemblance. Their common characters were so loose and superficial, that to say that a case belonged to any one of them gave no further information than could be derived from superficial observation of the case itself. The defects of this system of nomenclature were especially conspicuous in those outlying types of alienation which medicine had only recently included within insanity. In certain of these types the intellectual deficiencies were not very prominent, and the most obvious results of insanity appeared in feeling and conduct. Hence came names and varieties, such as moral insanity, general and partial moral mania, *manie raisonnante*, and so forth, all bearing on their face that they were based on totally different characters from those recognised by law. Had it been possible to prove clearly that all these were truly cases of bodily disease or defect, no mischief would have happened; at the worst, they could merely have been regarded as insufficient. But clear proof was rarely available in any one case, even in such as to the nature of which physicians were agreed. Scientific medical men were persuaded by a very wide experience, concurring with certain scientific hypotheses, that such forms of insanity really existed; and in each individual case they were guided partly by marks which rested directly on these hypotheses (for they were scarcely more), and partly on clinical impressions. Such evidence could never, in virtue merely of its own inherent value, have much influence in a law court. It was to a large extent incommunicable to those who were not already conversant with the subject, and could not therefore be received, except on the mere ground of expert authority. Such expert authority, however, did not and could not exist, for the preliminary ground of agreement among the experts was entirely wanting, and the courts were continually being informed of the fact by the enormous discrepancies of medical evidence.

While the physicians thus failed in many instances to persuade the courts that they were dealing with cases of insanity, much of the evidence on which they relied brought them into direct conflict with judicial experience, and suggested the possibility of gavre danger. The descriptions of the forms of insanity to which we have referred seemed perilously like ordinary depravity. The expert, it is true, avowed that to him a difference was visible, and that the case in question undoubtedly belonged to the class he recognised as insanity; but the judge on his side was also an expert, and declared them to belong to familiar forms of crime. So long, therefore, as the expert authority for the nature of these forms was not uniform and irresistible, every attempt to press them on the courts, unless very cautiously made, was extremely mischievous, for it led judges to believe that, if they gave any weight to medical evidence at all, it might become impossible to draw any clear line between insane and criminal action.

This suspicion was deepened by a wholly unwarrantable extension of the psychological classification. Cases of unexplained and motiveless crime occurred in which no certain evidence of general derangement, and no association with mania, melancholia, or dementia, could be detected, but which nevertheless, from the mere evidence of the crime itself, strongly suggested insanity. There were other cases in which insanity could certainly be detected, but in which a striking symptom was the persistent impulse, or temptation to commit some particular criminal act. Probably in all such cases a measure of general insanity could be traced by careful examination, and the particular act or impulse could be shown to have been nothing more than the accidental outcome of some more general disturbance. A general designation was convenient for medical purposes, even though not very well founded; and hence came such names as homicidal and suicidal mania, pyromania, kleptomania, erotomania, and so forth, including cases of widely different character, bound together by nothing but common criminal act. When such names were used, the tendency was of course to concentrate the attention on the circumstances attending the crime which formed the sole bond of connection with other cases of the same class; and it was an equally natural tendency to draw into the circle cases in which the crime presented some resemblance, but in which every other proof of insanity was entirely wanting. The possibility of extension thus became quite indefinite, and seemed to depend entirely on the view of the particular expert.

The difficulties which have beset the courts in dealing with insanity have thus arisen partly from the indefinite manner in which it was often presented to them, and partly from their own limited and superficial knowledge of its nature and phenomena. They have been naturally, and in some instances justly, apprehensive that the vague statements often made in the course of medical evidence might, if tolerated, seriously interfere with the proper administration of the law; and, on the other hand, they have been led, partly by their apprehensions, and partly by theories and rules, which were founded upon very imperfect knowledge, to exclude from consideration facts which are eminently relevant and important.

Before discussing, therefore, the bearing of insanity in each particular branch of the law, we must obtain a conception of its nature and limits, and of the general character of its mental phenomena.

Although the older lawyers had a very vague conception of the nature of insanity, they were at least certain that it differed from any of the normal mental conditions, not merely in degree but in kind. The early cases of insanity were not recognised as exceptions, merely because they presented very striking mental features, but because such features seemed to rest on something outside the ordinary sphere of will. The judges were at all times careful to insist on the necessity of proving the existence of mental disease, even when they had no distinct idea of what mental disease was. It was not enough to plead irresponsibility or incapacity, in general terms. The law required a definite ground or cause to start from; not merely on account of the loose and unsatisfactory nature of these general investigations, but because otherwise it might readily drift into the reception of excuses and exceptions which were contrary to its general policy. It does not, of course, follow that to prove the existence of the ground is in itself enough. The ultimate question always remains, whether the effects of it are sufficient to abrogate responsibility or capacity. But, in the first place, we must know clearly, what is the nature of the ground on which the law will permit an inquiry into the mental condition; what is the essential element which separates insanity from other unfavourable mental conditions, and distinguishes it from depravity, stupidity, or eccentricity, from the violent excess of passion or emotion, or from the natural decay of old age.

Every one is now agreed as to the nature of this element; no one doubts that all the cases which are properly called insanity result from conditions of physical disease or defect; what was formerly recognised as mental disease is now known to be the effect and symptom of physical disease. In its widest sense, therefore, we apply the term insanity to those defects or aberrations of the mental functions which are caused by physical defect or disease of the brain.

The value of a definition so general as this is of course merely theoretical. It only serves to point out the general ground on which cases of insanity are distinguished from the normal mental conditions, and its practical application depends on the details which are included under it. The mental functions are affected in a greater or less degree by a great variety of morbid conditions, to many of which we never think of applying the term Insanity. In the delirium of fever, for instance, the mental effects, although serious, are so obviously symptoms of bodily disease, that they have never been embraced in the popular conception. In other, and indeed in nearly all diseases, the mind is more or less affected in the way of weakness or depression, but rarely to such an extent as to be taken into account, except in connection with extraneous circumstances. On the other hand, there are morphological defects with which mental impairment is connected; numerous diseases of the general system with which insanity may be associated, either as a primary or secondary consequence; evolutional or involutional periods, during the persistence of which morbid mental phenomena may present themselves; and groups of poisons which act directly on the brain, and produce so-called mental disease. With a few, but not unimportant, exceptions, the very large proportion of cases of insanity can with certainty be referred to one or other of these four classes of morbid agencies.

We propose to discuss the natural history of those morbid conditions, in detail, in future papers; but we must in the mean time glance at their general character and divisions. In so doing, it should be remembered that we are dealing with the obscurest province of medical science. Hence, we may expect that the nature of these morbid conditions, their relation to each other, and even their very names, are to some extent still undetermined. It is more than probable that as the line of inquiry is followed up, certain classes may be found placed under one group which may subsequently require to be broken up; and, on the other hand, that subsequent investigation may show that the same pathological conditions may underlie varieties which have been erected into species on grounds of origin or appearance, which are not essential. It is certain that the elaboration of the products of bacterial activity will exercise material influence in this direction. Such a rearrangement may happen, and indeed has done so in every department of medicine; but, without doubt, certain great classes of insanity have distinctly separated themselves; and the others form groups, whose members, notwithstanding that their relations one to another may be changed by the progress of investigation, are, to say the least, closely enough united for practical purposes.

The following are the most outstanding of such groups; they have, moreover, been generally accepted as convenient, as they tend to direct the observer towards underlying somatic morbid conditions:—

Idiopathic mania, melancholia, and dementia.
General paralysis of the insane.
Traumatic insanity.
Toxic insanity.
Insanity associated with other neuroses—Epilepsy, hysteria, hypochondriasis.
Insanity consequent on the action of diseases of the general system—Syphilis, sunstroke, fevers, etc.
Insanity concurrent with evolutional and involutional conditions—Adolescence, climacteric period, old age, pregnancy, the puerperal period.
Insanity of degeneration and defect—Paranoia, idiocy, and imbecility.

(*To be continued.*)

ABDOMINAL AND PELVIC SURGERY.

By RUTHERFORD MORISON, F.R.C.S., *Surgeon to the Royal Infirmary, and Consulting Surgeon to the Dental Hospital, Newcastle-on-Tyne.*

THE term "abdominal surgery" is, by many, limited to operations which open the peritoneum through the anterior abdominal wall; and the term "pelvic surgery" to those operations peculiar to women. I intend to make no such limited application, but to include all the abdominal and pelvic contents in males and females, and the walls of these cavities, in my remarks.

I also intend to give the statistics of my hospital practice in 1903. These will include every case operated upon by myself during nine months of work, both in the Royal Infirmary and in a private hospital here; and the notes will be limited, as far as possible, to experiences based upon these cases. No one who has looked over Hospital Reports can fail to be struck with this fact, namely, that the results of operations, as set forth in them, offer a very different showing to the statistics of series of the most difficult and dangerous operations, performed with an insignificant mortality, which are published in current medical literature. It is apt to be forgotten that these remarkable results have been published because they are exceptionally good. They have their uses; they show what can be done by skilful operators, who make a careful selection of cases, and they serve as a stimulus to improved results. It is, however, misleading and dangerous to judge of general results by these special examples, and to bury the former in oblivion, as is apt to be done, while the latter occupy a foremost position.

Medical men, not practising surgery, and their patients, may be misled by statistics of an exceptional kind. They may have to learn that operations cannot be undertaken with impunity; that recovery is not always "uneventful"; and that the unlikely sometimes happens in surgery as in other affairs of life. It is better that such facts should not be brought to the knowledge of the profession, and of the public, by bitter personal experience, for this is likely to produce a bad impression of surgeons and their work. We require rather to indicate probabilities than possibilities.

Chiefly for this reason, I think it may be useful to offer the results of the whole of my work for the period mentioned, with a complete record, not only of its successes, but also of its failures and its disappointments, which often teach much.

The major part of the work has been done in the Royal Infirmary, a busy general hospital, and in a building more than a century old, and without a single feature which would commend it to the modern operating surgeon. Indeed, the surgical arrangements in the operating theatre, and in the wards, are inferior to those of the old Royal Infirmary of Edinburgh, as it was when I held the post of a house surgeon in 1875. It is a matter of equal interest and importance to know how far surgical results are influenced by the elaborate and often costly arrangements of modern hospitals; and this is an additional reason for my record of the year's work. If this question is not fully answered sooner, it can be so here when the New Infirmary, at present in course of erection, has been completed.

The relative paucity of emergency cases is explained by the fact that most of those admitted to my department at the infirmary are operated upon by my assistants. The large proportion of operations for diseases of women is due to the fact that all surgical cases come under the care of the surgeons, and into the surgical wards.

DIAGNOSIS.—A careful study of the history, a careful consideration of the symptoms, and a skilful interpretation of the physical signs, will lead, in the great majority of cases, to a correct diagnosis. The difficulties and uncertainties of diagnosis have been overrated, and this to such an extent as to discourage the practitioner in his efforts to arrive at a definite opinion before proceeding to operation.

There are certain lines of inquiry to be followed in every case. The general appearance of the patient should be the first consideration, for it may teach a most useful lesson. It is impossible to describe the gait and bearing of diseased persons; these must be learned by repeated and patient observation. The most important lesson, however, is soon and easily learned; it is to answer the question, Does the patient appear to be seriously ill, or not? Even in the absence of signs of serious organic disease, if the general appearance of the patient suggests illness, it is wise to hesitate before offering a very hopeful prognosis. In other words, the diagnosis and prognosis must not be based simply upon local physical signs, but must take into consideration a wider field.

The yellow complexion of jaundice, the waxy anæmia of long-continued hæmorrhage, the muddy anæmia of syphilis and of cancer—these may convey a useful hint; so may the shape of the abdomen, the way the patient walks, or sometimes the presence of an odour. Then, with a view to ascertaining the possible source of mischief, it is well to ask the question, Where is the chief trouble? After this, in difficult cases, the history of the illness should be carefully inquired into; and it is usually best to let patients tell the story in their own way, asking questions now and again on points requiring more definite information. It is important to know when the illness commenced. A tumour, for example, which seems to be the probable cause of illness, although it may present all the signs of malignancy, is not likely to be malignant if it has been recognisable for more than two or three years.

SIGNS AND SYMPTOMS.—There are certain signs and symptoms on which special stress must be laid. They may be summarised under the following headings:—

Pain.—The character of this, and its position and distribution, are important points. Nearly all acute instances of serious abdominal lesions are ushered in by a pain of overwhelming severity, which usually, at the very commencement of it, can be roughly localised to the neighbourhood of the lesion. Very soon, however, the pain becomes diffuse, while at a later stage it may again become a guide to the situation of disease. The deadly character of this pain must be insisted upon. When a serious abdominal catastrophe has occurred—one so serious as to make it probable that nothing but immediate operation offers a reasonable hope of recovery—the pain is always one of the most important indications, and, indeed, it may be the only one. A common greeting from the worst cases is—" Oh ! doctor, I am dying ! I am dying ! "

Intermittent pain of great severity suggests the forcible contraction of unstriated muscle. It occurs in cases of intestinal obstruction, gall stone, calculi passing down the ureter, and retention of urine; and it occurs physiologically as the termination of pregnancy. It is a more severe pain than any other, but does not convey the message of impending death.

Acute continuous pain occurs in inflammatory affections, chiefly involving the peritoneum, chronic continuous pain in cases of tumour, especially of a malignant character. It is of some importance to know that pain never attends certain organic abdominal and pelvic diseases, such as, for example, uncomplicated hæmorrhoids, simple tumours, and enlargement of the prostate; so that this symptom points to complications, or to malignancy.

Tenderness is characteristic of inflammatory complications; and the position of the lesion may often be determined by the discovery, through careful steady pressure of the finger tip over different parts of the abdominal wall, of the most sensitive point. M'Burney's point, in appendicitis, is a remarkably useful illustration; often no less characteristic, in disease of the gall-bladder, is a point opposite the tip of the ninth rib and at the outer edge of the rectus muscle. In duodenal or intestinal or gastric ulcer, this point may also be a guide in localisation. It is difficult to offer any reasonable explanation of this point tenderness.

Rigidity of the abdominal muscles.—Rigidity is the earliest sign of an underlying peritonitis, and one of the greatest importance as an aid to diagnosis and prognosis. Over an inflamed spot of peritoneum the muscles become board-like from their hardness; and if the peritonitis spreads, so does the muscular rigidity over the spreading area of disease. In cases of general peritonitis, the whole abdominal wall is so hard and fixed as to stop all respiratory abdominal movements.

Rigidity, like tenderness, is not only possessed of value as a diagnostic sign, but may also be a good guide to the localisation of the lesion. For example, localised rigidity in the right iliac fossa (and it is surprising how restricted in area it may be) is often the chief diagnostic localising point in cases of appendicitis. A similar condition in the right hypochondrium is equally characteristic of cholecystitis.

Vomiting is a common symptom in all acute abdominal lesions, and one of value in diagnosis and prognosis. Repeated vomiting alone, in an acute case, suggests a serious lesion. The quantity and character of the vomited matter may be the most important aids to diagnosis. A large quantity of watery bile-stained vomit suggests intestinal obstruction, which may be the result of acute peritonitis, or may be of purely mechanical origin. If this be followed by liquid having the appearance of egg beaten up in beef-tea, or by thick pea-soupy liquid with a fæcal odour, there can be no doubt that the contents of the small intestine are regurgitating into the stomach. Indeed, fæcal vomit, for practical purposes, is considered as pathognomonic of intestinal obstruction; and so it is, but occasional exceptions occur. On one occasion, on the strength of this sign, I operated and found a malignant growth adherent to the transverse colon. Post-mortem examination showed a malignant ulcer of the stomach invading the transverse colon, and a fistulous communication between them. On a second occasion, I was guided to a correct diagnosis in a similar case by the fact that part of a turpentine enema was vomited during the act of its administration.

A large quantity of yeasty, evil-smelling matter vomited in the evening, containing perhaps recognisable portions of food partaken of in the morning (orange is easily recognised) is characteristic of stomach dilatation due to stricture of the pylorus, for it occurs in no other condition. Hæmatemesis in young females is often the only warning of the presence of gastric ulceration. Hæmatemesis and melæna in young males of duodenal ulcer, and in older persons it may be the first evidence of cirrhosis of the liver. Coffee-ground vomiting after an abdominal or pelvic operation (except in the early hours, when it may be due to abdominal shock) is always regarded as of very evil omen, for it is associated with the petechial hæmorrhages of the gastric mucous membrane always met with post-mortem in general septic peritonitis.

To know the force with which vomited matter is ejected may be useful in diagnosis. The forceful ejection of a large quantity in cases of intestinal obstruction, and the frequent quiet regurgitation of mouthfuls in general peritonitis, are suggestive points.

The condition of the bowels.—Of the two ordinary contents of the large bowel, gas and solid, the most useful hints are obtained from a knowledge of the behaviour of the former. Inability to pass flatus per rectum, with forcible painful rumbling and belching, are pathognomonic of the presence of intestinal obstruction; the free passage of flatus per rectum after an abdominal operation is the most certain assurance that a dangerous amount of peritonitis is absent.

Bladder symptoms.—Retention and increased frequency of micturition are both common symptoms of abdominal and pelvic disorders. The most frequent causes of retention are: In male children.—Stone in urethra; string round penis. In young men.—Gonorrhœa (prostatitis). In older men.—Stricture. In old men.—Enlarged prostate. In young women.—Backward displacement of pregnant uterus. In older women.—Fibroid tumour of uterus.

The operations for hæmorrhoids and inguinal hernia in men, and perineorraphy and severe abdominal operations in women, are frequently followed by retention. If old patients, some days after an operation, are found to be not doing well, the condition of the bladder should always be investigated. A new house surgeon has generally to be taught that the bladder may be over-distended without complaint on the part of the patient, and that a dry tongue may be the only indication that the bladder is being imperfectly emptied.

Pulse and temperature, if a complete record be obtainable, are useful guides in the diagnosis and prognosis of acute abdominal disorders.

Both are raised soon after the commencement of all acute attacks of peritonitis. Progressive increase in the rapidity of the pulse is one of the most certain guides to a steadily progressive lesion. An adult pulse over 100 always suggests serious disease. The differential diagnosis between acute peritonitis and intestinal obstruction of mechanical origin is materially aided by a knowledge that the temperature has been elevated; for a rise in temperature does not occur in the early stages of mechanical obstruction.

Also, certain tumours, especially in the pelvic and right iliac region, may be suspected to entail more serious risk if it be known that at some period of their existence a high temperature was associated with them. The fact that abundant pus is frequently found locked up in the abdomen without any rise in temperature, has led some authors to express the opinion that the thermometer is of no practical use in abdominal diagnosis. That it may be misleading if only a few observations are made, and if the temperature alone is considered, is quite certain; for blood in the peritoneal cavity, as in ruptured ectopic gestation, may cause a high temperature, and fœtid pus in large quantity may be found with a normal one. After a serious operation, moreover, a rise of temperature, even up to 102°, may be a good sign, especially if the pulse does not show any excessive speed, for it indicates reaction. Nevertheless, after allowing for the chances of error occasioned in these exceptional circumstances, it is still possible to find the temperature an important aid in abdominal diagnosis.

The tongue.—A dirty furred tongue always suggests the need for care in abdominal diagnosis. After an operation it means that the patient is not yet out of danger. A moist brown tongue usually means that the bowels require attention and are not being properly evacuated. A dry brown tongue is of worse omen, for it is often associated with failing circulation; that is, if no other cause is known to exist, such as an insufficiently emptied bladder or damaged bowel after strangulated hernia. In old people, dryness of the tongue, especially in the morning, is not of such serious import as in younger and more vigorous persons. A scarlet-red moist tongue is suggestive of the presence of suppuration. A dry red tongue indicates feeble vitality and a want of reparative power.

Menstruation.—In women the menstrual history may be of the greatest value. Excessive and irregular flow are always the result of a less or more serious organic cause which requires thorough investigation. A young healthy adult woman, previously regular, who has missed a period over a week, is, in all probability, pregnant. It is a curious fact that, though women may under certain circumstances be full of anxiety to deceive themselves and others into the belief that pregnancy is impossible, I have never known one to give a misleading menstrual history. If a diagnosis that the abdominal or pelvic swelling is a tumour be never made, in the presence of amenorrhœa, till pregnancy has been positively excluded, many painful and damaging mistakes will be avoided.

Facial expression.—The patient's expression may convey an unmistakable message. Who that has ever seen the grey pinched face of general septic peritonitis is likely to forget it? The presence of jaundice following an acute attack of abdominal pain is characteristic of gall stones. Pigmentation of the skin of the forehead suggests a possible pregnancy. Dilated pupils with alternate flushing and pallor of the face and neck are seen only in highly nervous, emotional subjects. Drooping, heavy upper eyelids in young women indicate a tendency to the grave forms of hysteria which are sometimes associated with abdominal conditions simulating tumour. A dilated condition of the capillaries of the cheeks and nose may aid in the diagnosis of a cirrhotic liver or enlarged spleen. The waxy anæmia of recurrent hæmorrhage suggests inquiry as to the presence of hæmorrhoids or metrorrhagia. The deadly pallor of a ruptured extra-uterine gestation has been known to afford the greatest aid to diagnosis in an acute abdominal emergency.

EXAMINATION OF THE ABDOMEN AND PELVIS. — *Inspection.*

—The patient should lie in bed with the shoulders comfortably raised, with the chest and legs covered up, and the abdomen fully exposed to view.

Any peculiarity of the parietes is noted. Fixity during respiration occurs in all inflammatory states. Localised œdema suggests the presence of suppuration underneath it; enlargement of the superfical veins, some obstruction to the deep venous circulation; a thick, dark pigmented linea alba, pregnancy either in progress or recently passed; marked flaccidity and wrinkling of the parietes, a recent confinement.

The abdomen may either be flat or protuberant. If it is flat it may be possible to note movements in it. Exposure of its surface to the cool air stimulates peristalsis in the stomach and intestinal canal, and though normal peristalsis is only visible through the thinnest parietes, the increased movement of hypertrophied stomach or intestine may be a valuable aid in diagnosis. It is possible to watch, in the dilated stomach, a wave of vigorous peristalsis pass from left to right, and terminate at the strictured pylorus. In cases of intestinal obstruction, the outline of the hypertrophied intestinal coils may be so definite as to make a diagnosis certain, and it may also be possible to locate the site of obstruction by noting the ladder-like pattern assumed by the small intestine, the right iliac distension of the cæcum, and the appearance of the transverse colon as a large round bar. A small tumour may also be seen, especially a pyloric one, when the abdomen is flat and the patient thin; and its mobility or fixity may be observed during the respiratory movements.

If the abdomen is enlarged, the enlargement may be local or general.

A local enlargement suggests the presence of a tumour of moderate size, and the position of the enlargement may give a clue to the origin of such a tumour, if one is present. Careful observation may enable the outline of it to be defined, and the character of its surface, *e.g.*, whether nodular, rounded, etc., to be distinguished. Its mobility during respiratory efforts or changes in position, may also be noted; while in the case of pregnancy, the movements of a fœtus may be clearly seen.

If the enlargement is general, inspection may discover that whilst the abdomen is enlarged the chest and limbs are wasted; this is certain evidence of organic disease: or it may show that the abdominal enlargement is associated with general obesity, of which the abdominal swelling may be only a part.

Shape of the abdomen.—The shape of the abdomen may also help in diagnosis. The forward convexity of a large tumour distinguishes it from the more lateral and general enlargement of free fluid or of fat.

Palpation.—This is certainly the most important method of examining the abdomen; hence it is necessary to know how to do it to the greatest advantage. Both the patient and the examiner's hand should be thoroughly warm, otherwise the difficulties of the examination are materially increased. On the flat abdomen the

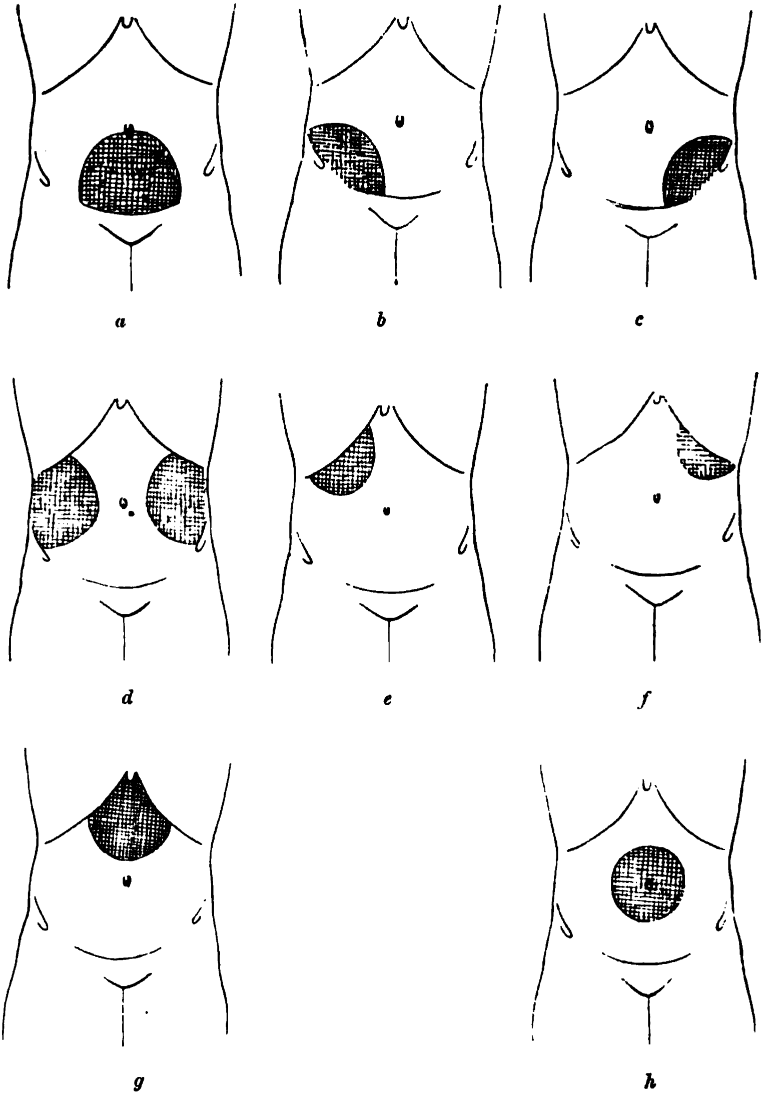


FIG. 1.—Showing regions of tumours—(*a*) Ovarian, uterine, vesicle ; (*b*) ileo-cæcal valve, cæcum, appendix, right half of the pelvis ; (*c*) sigmoid flexure of colon, left half of the pelvis ; (*d*) kidney ; (*e*) liver, gall-bladder ; (*f*) spleen, splenic flexure of colon ; (*g*) gastric, pancreatic ; (*h*) small intestine, omentum.

examiner's flat hand is gently applied and moved easily from place to place over the whole.

Tenderness and rigidity.—Tenderness and rigidity of the parietes are first sought for. A localised area of tenderness and rigidity affords evidence of an inflammatory lesion underneath. In cases of intestinal obstruction, the hand may distinctly feel forcible peristaltic movements, and localise, by the arrest of the peristaltic wave, the probable site of obstruction. In stomach cases, manipulations over the stomach, while they produce the splashing sounds characteristic of dilated stomach, may induce a peristaltic wave strong enough to be felt; it is, however, so far as I have observed, not so strong as the peristalsis sometimes observed in intestinal cases. The greatest use of palpation is to enable the observer to decide as to whether a tumour is present or not; and this may be so easy that any one can do it, or so difficult that no one can. Except in the most muscular or fat abdomens, it should always be possible, by suitable methods and especially by the aid of bimanual examination, to say, at least, whether a tumour is present or not; and in the great majority of instances it should be also possible to form a correct estimate of the character and relations of the tumour. The use of an anæsthetic in the most difficult cases often clears away doubts, for, in the absence of sensation, the relaxation of the parietal muscles allows of more thorough palpation; but it is not without dangers of its own; this method should therefore be resorted to but seldom, and then with the greatest care. A quite small tumour can be detected in the flat, lax abdomen, and with a finger in the rectum or the vagina and a hand on the abdomen (Fig. 2), the whole contents of the normal pelvis can be palpated. All of these manipulations may be aided by having the patient lie in a position such as to relax the abdominal muscles to the greatest extent; and when the patient is lying on the back, this is to be found by raising the shoulders and supporting the head and keeping the thighs flexed. A small elongated tumour, which alternately hardens and contracts, is characteristic of intussusception.

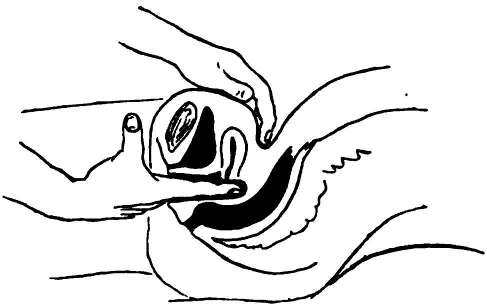


FIG. 2.

If the abdomen is enlarged, the discovery of a tumour by inspection and palpation may still be easy or difficult. The most definite evidence is to be obtained by bimanual examination. It is scarcely possible to form a wrong opinion as to the presence of a tumour, even in the fattest or most muscular abdomen, if it can be felt between the two hands, either one on each side of the abdomen (Fig. 3), or one in front and the other behind (Fig. 4).

If a definite swelling is certainly present, it is well to remember that in the case of male patients, nine out of ten such growths are malignant; and in women, nine out of ten are the pregnant uterus. Before going any further, therefore, the possibility of either of these conditions should be fully considered. It is also important to have the bladder undistended, because it may be and frequently is mistaken for a cyst; and to have the colon empty, for solid fæces in it resemble so closely a malignant growth as to have often misled skilled observers.

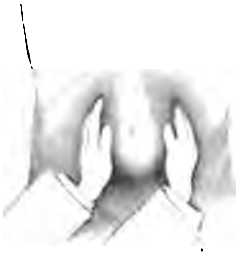


FIG. 3.

When a tumour has been discovered, the next step is to try to ascertain whether its contents are fluid or solid. A fluid under tension, as in the distended gall-bladder, may produce so hard a tumour that it feels like anything but fluid. A soft solid tumour, on the contrary, such as a lipoma, a soft sarcoma, or an œdematous fibroid, yields a sensation of elasticity so closely resembling fluctuation as occasionally to deceive the most wary. For my own guidance, I have made, for cases of abdominal tumour, the following rule: that, if I cannot feel fluctuation, or cannot detect a fluid thrill in the tumour, it is probably solid; it is to be remembered, however, that the gall-bladder forms an exception to this rule. In the pelvis it is more likely to be correct to regard as a cyst every doubtful tumour which is in the least elastic, and which is not very definitely hard.

Next, it is well to discover, if possible, the relation of the tumour to the abdominal organs; for example, a gall-bladder tumour in the right hypochondrium resembles, and is often mistaken for, a movable kidney. This error can be certainly avoided by feeling the kidney behind and separate from the tumour.

FIG. 4.

Then, the tumour may be mobile or fixed. If mobile, its movements may be independent as in the case of an omental growth or of any pedunculated tumour; or, though movable, it may in its wanderings carry with it some organ to which it is attached. All tumours above the umbilicus are more or less influenced by the respiratory movements of the diaphragm; and those that are connected with the viscera in contact with it, liver, kidneys, spleen, and stomach, unless they are fixed by adhesions, move during respiration; they move freely downwards on forced inspiration and upwards on expiration. In the lower abdomen of women, movements of a uterine or ovarian tumour are liable to communicate their movements, more in the case of uterine, less in the case of ovarian, to the cervix of the uterus felt per vaginam.

Mobility can also be tested by moving the tumour between the two examining hands, passing it from one to the other; or by making the patient change position, turning on to the side, or standing up, or resting on knees and elbows. The latter position is useful in testing whether a tumour lying over the aorta and pulsating is attached to the vessel or not.

The surface of the tumour may next be palpated. It may be rounded and smooth, as in the case of unilocular cysts, or craggy and nodular, as in many malignant growths; or with rounded bosses upon it, as in some multilocular cysts (kidney or ovarian) and uterine fibroids.

Its edge may be sharp, as in the case of a dislocated liver; notched, as occurs characteristically in an enlarged spleen; hard and nodulated, as in a malignant growth.

Succussion or gurgling over the tumour may show it to be overlapped by stomach or intestine.

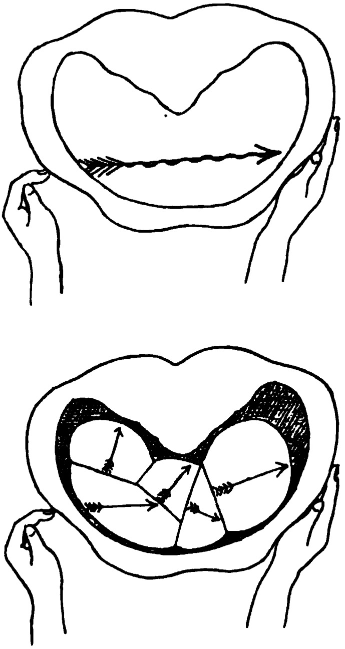


FIG. 5.

Pulsation is perceptible in most small tumours overlying the aorta. It is not of an expansile character, and disappears when the tumour is lifted off the aorta; by both of these characters it may be distinguished from that of an aneurysm.

A cyst or other collection of fluid gives a thrill on palpation (a hand on one side of the cyst, a flip on the other) (Fig. 5). By noting the quality of the thrill and the directions in which it is most easily transmitted, the diagnosis of a multilocular cyst, or one with thick contents, is possible.

If the tumour consists of a solid body floating in fluid, ballottement may be felt. It suggests pregnancy or cancerous peritonitis; for other conditions causing it (ruptured ovarian cyst, uterine fibroid, and free fluid) are very rare.

Enormous distension of the abdomen, without corresponding swelling of the legs, suggests a very large, slowly-growing ovarian cyst. Enormous abdominal distension, with corresponding swelling of the legs, suggests ascites. Distension which disappears after the night's rest and gradually increases up to the evening, suggests tympanitis.

Percussion.—Though of less value than inspection or palpation, percussion may be a valuable aid to diagnosis. Over the majority of abdominal tumours of any size, there is a dull area corresponding roughly to the size of the tumour, and this area is dull on both light and strong percussion.

If palpation has detected a definite tumour, and if this has a tympanitic patch or strip on it, adhesions to the stomach or intestine are suggested; this is to be expected in renal tumours in front of which the colon lies, and in other retroperitoneal growths, such as pancreatic cysts, aneurysms, and solid tumours, lying behind the stomach or intestines. The tympanitic note, in these instances, may only be discoverable on light percussion.

The typical dulness of free fluid with a patient lying on the back is, of course, to be looked for at the dependent parts. It appears first in the flanks, and, as the quantity increases, forms a gradually increasing band above the pubis. A large quantity of fluid can be discovered by any one; it is a knowledge of how smaller quantities may be found that is of importance. Within a few hours of their onset, all acute abdominal lesions, which are about to be followed by general septic peritonitis, develop a sufficient amount of peritoneal fluid to be discoverable by careful percussion. Each flank, in its most dependent part, will be found to be dull on light percussion, and the upper limit of this dulness must be carefully noted. On turning the patient over, the upper flank becomes resonant, and the dull area on the dependent side reaches a higher limit. This evidence, if conclusive, is of great significance. In young women, this sign occurring together with profound sudden anæmia may be the only available evidence of ruptured ectopic gestation, with a dangerous escape of blood into the peritoneal cavity. The distended intestines of intestinal obstruction may cause dulness in one or both flanks, but a change of posture is not likely to increase the dulness of the dependent side, so that this point is as important to note as the fact of dulness itself.

The tympanitic corona of an ovarian cyst (Fig. 6) is evidence of very great value in favour of a cyst, as distinguished from an encysted collection of fluid (Fig. 7). I have never found this sign in anything but tumour, and in its absence I have many times declined, never with any cause for regret, to accept the view that a tumour was present, when everything else appeared to be in favour of this belief. This sign is never, so far as I have observed, to be found in the cases which so closely resemble ovarian cysts, and in which mistakes have become classical, the encysted collection of fluid due to tuberculous peritonitis. In this condition the shape of the abdomen, the resonance in the flanks, and the signs of an encysted collection of fluid, may all mislead; but percussion of the upper abdomen shows a more or less V-shaped area of resonance, the point of the V downwards; whereas, in a cyst, the convexity of the resonant area points upwards.

In cases of enormous distension, the absence of dulness and presence of a tympanitic note all over are the best evidence that the swelling is due to excessive gas in the intestines.

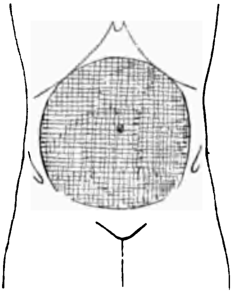


FIG. 6.—Ovarian cyst—shape of dull area.

Auscultation is of less value in abdominal diagnosis than any of the other methods mentioned, but it cannot be neglected with impunity. One of the most certain evidences of chronic intestinal obstruction is the presence of borborygmi, which may be loud enough to be heard by any one in the same room as the patient. Another sound more conclusive still, is produced by the passage of fluid intestinal contents through a contracted portion of gut, which may be heard with the ear close to the abdominal wall or with the stethoscope. A sound like that produced by milk squirting into the milking-pail is also reliable evidence of intestinal obstruction, and patients will frequently tell themselves of this sound attending the forcible rumblings. It is said by reliable authorities that auscultation offers a useful means of distinguishing between cases of acute intestinal obstruction and acute peritonitis; that in the first, peristaltic movements are heard, whilst in the second, they are absent. I have not found this to be so true as to be helpful.

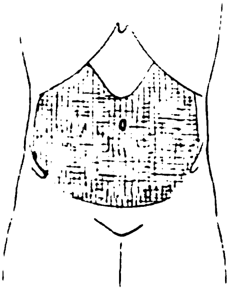


FIG. 7.—Encysted ascites—shape of dull area.

There is one condition in which the importance of auscultation can scarcely be exaggerated, and this is in cases of suspected pregnancy. After four months, the sound of the fœtal heart may be perceptible, after the fifth month it should be heard. With this exception, there is no absolutely certain evidence of pregnancy. Every other sign and symptom may be found either real or simulated, hence the importance of this. When grave issues hang on the diagnosis of pregnancy, I think it should be the rule (a rule which I always act upon) to offer no positive opinion unless the fœtal heart can be heard. More professional reputations have been wrecked upon this rock than upon any other I know of, and it is only by adhering strictly to the rule I have named that mistakes can *always* be avoided, as mistakes should be, when reputations and lives may be at stake. Lest there should be any misunderstanding as to my meaning, it is necessary to explain that in ordinary cases, and under the usual conditions, *i.e.*, as a practical guide to action, the symptoms and signs of pregnancy are so straightforward and definite that careful examination, any time after the sixth week, will enable a skilled observer to offer an opinion, which is seldom wrong, as to the existence or otherwise of pregnancy. As a matter of scientific evidence, the fœtal heart-sounds only are to be thought of.

The statement is often made that gall stones have been heard and felt grating against each other in the gall-bladder, but I have not personally heard or felt them do so, though I have often tried. The pathological condition of a gall-bladder filled by stones adds to my doubt of this possibility; and the frequency with which the ninth costal cartilage can be so manipulated as to produce rough friction, suggests a possible source of error.

Auscultatory percussion is a valuable aid in marking the outline of a dilated stomach. A bimanual stethoscope with the ear piece over the stomach can distinguish by the loudness of the sound when a flicking finger, starting at a distance from and gradually approaching, has reached the stomach. By marking this spot and others in the same way, the area occupied by the stomach may be clearly mapped out.

A systolic murmur may be heard over many tumours near the abdominal aorta which are not aneurysms; in some abdominal aneurysms no murmur is to be heard, so that no conclusion must be based on the presence of this sign alone.

Instrumental aids.—The use of special instruments as aids to diagnosis is, in the great majority of cases, unnecessary; and fortunately so, because some of them require considerable practice and opportunity and skill for their satisfactory handling; and their application may not be devoid of risk. Nevertheless, Röntgen rays, the cystoscope, stomach tubes, and the various specula, are essentials for the diagnosis and proper treatment of some abdominal and pelvic diseases.

Examination of the blood.—Recent developments in the examination of the blood and the urine promise to be of value in the diagnosis and prognosis of abdominal disease, and to afford guidance as to the propriety, or otherwise, of undertaking serious operations.

The most useful and definite information we have so far derived from these examinations is, that leucocytosis is strong evidence in favour of the presence of pus.

Aspiration.—I have so often had to deplore disasters following the use of exploring syringes, aspirators, and trocars, that I almost share the strong feeling of condemnation of them all expressed by many recent authorities on abdominal surgery, who would entirely prohibit their use. Except as immediately preliminary to a possible operation, this would probably be a good rule; but in the pelvis especially, needle puncture of a suspected pus collection through the rectum or the vagina before incision may give valuable aid, and may prevent a useless operation from being carried out.

Exploratory incision.—"To explore in all cases where a diagnosis cannot at once be made, is undoubtedly a defect in the present system, because it leads to insufficient training of the diagnostic powers, and I think that, unless there is some important reason demanding immediate diagnosis and treatment, one should not explore till other means of diagnosis have been exhausted. An exploratory laparotomy is not always the harmless procedure that is generally supposed. Accidents may happen in the aseptic technique and in other parts of the operation; as for example, in the separation of existing adhesions, adhesions may form subsequently and give much trouble; and patients who are suffering from debilitating diseases are often the worse for the exploration, unless some remedial procedure can be carried out at the same time. For example, a patient with inoperable cancer is decidedly not benefited by an exploratory laparotomy. The operation must lead in any case to a certain amount of general disturbance, varying in different cases, partly as the result of the anæsthetic, partly as the result of the intestinal disturbance, partly as the result of the confinement to bed, etc. As a consequence, the patient's condition may be very seriously altered for the worse, and, especially in the case of a patient who has been going steadily downhill, is very emaciated, and has only a short time to live, this may be a very serious matter, and may shorten his life to a considerable extent.

"I do not wish it to be thought that I am in any way against exploratory operations, but I do think they ought to be employed with great judgment, and not as a mere matter of routine. There are many cases in which, if the diagnosis is doubtful, it is essential to make it certain as soon as possible; in cases, for example, of suspected malignant disease, it is important to have an early diagnosis from the point of view of an early radical operation. The rule that I should lay down as regards exploratory operations is, that they should only be undertaken where there is a reasonable probability that some remedial procedure can be forthwith carried out,—such procedures, for instance, as the removal of growths, the separation of adhesions, the performance of intestinal anastomosis, and so on. The object of an exploratory laparotomy should not merely be a question of diagnosis; it should be a question of diagnosis in a case where there is a probability of following up the diagnosis immediately by treatment that is likely to benefit the patient."[1]

SELECTION OF CASES FOR OPERATION.—No surgical question appears to me to be of such importance as that of the selection of cases which require operation—a question which includes also a consideration of the time at which operation should be performed, and of the form of operation to be done.

This question is perhaps of greatest importance in cases complicated by acute sepsis; and of this we have a striking example in the discussions still carried on as to "when to operate in cases of appendicitis." No one now doubts that the recurrent and least dangerous cases should be operated upon by choice in an interval between attacks; the discussion centres on the treatment of acute cases, *i.e.* those complicated by the presence of septic infection. Every surgeon knows that an operation in such conditions may be followed by an acute general infection and speedy death, and this in spite of all the means known to him, and usually successfully employed to avert it. Until these exceptional cases can be recognised, the doubts and the disputes may be expected to continue. Meanwhile, we are reduced to the gross method of judging from personal experience and from statistics. To be able to answer the question satisfactorily for appendicitis, would lead us far on the road to knowing what to do in other conditions, in which the doubt is of equal importance. In acute gall-stone attacks, and in the acute forms of pelvic peritonitis in women, death may result from the severity of the illness; but many more cases will recover from the acute attack, if not operated upon, than will die. It is certain that some of the acute cases that died would have recovered after a complete operation, while more would have recovered after an incomplete operation done for the sole purpose of drainage. But it is even more certain that some of the cases which have recovered would have died with tragic rapidity if operated upon; and the worst feature of this knowledge is, that it is impossible in many instances, with our present information, to say which result is likely to follow any given surgical operation. All we do know, and the importance of knowing it is slowly becoming appreciated, is, that if the focus from which infection spreads can be removed early enough, the patient will probably recover. The difficulty is in coming to a conclusion before the time allowance of "early enough" has been exceeded. After twenty-four hours, most septic infections cannot be arrested; and in the abdomen, after this time, they may terminate as favourably without operation as with it, *e.g.*, general peritonitis of more than twenty-four hours' duration, the result of perforated appendix, is unlikely to be benefited by operation, and very few of the patients operated upon recover. Our experience has satisfied us that without operation a larger percentage can get well. The records of operations undertaken for the treatment of gastric and duodenal ulcers, which have perforated for more than twenty-four hours, suggests that nothing might be lost by leaving them alone. In cases of intestinal obstruction the same difficulty is felt. If the patient is seen, and if a diagnosis can be made, within a few hours of the commencement of the attack, operation offers an excellent chance of recovery; and early operation is *the* treatment of all acute cases. Later, when distension of the abdomen has occurred, and if the obstruction be acute and situated in the small intestine, I am satisfied that a complete operation for the radical cure of the obstruction does not offer the best chance of recovery. The patient may be so well generally, and the chances of spontaneous recovery so fair, that it seems inadvisable to suggest the palliative operation of enterostomy, and it may be safe to delay this operation for draining the intestine till a further chance has been given to more medical methods.

---

[1] Watson Cheyne, *Clin. Journ.*, London, November, 1903. This extract entirely expresses my own views, and the weighty opinion of such an authority as Professor Cheyne may help to check the tendency to indiscriminate exploratory incisions.

In cases of hæmatemesis, though it would appear to be good surgery and a rule of the greatest value to cut down upon and secure the bleeding point, my experience has convinced me that it may be bad treatment because impossible of attainment, and that a careful selection must be made if operative treatment is not to do more harm than good. Bleeding from the stomach cannot be judged by surgical canons, and further knowledge of it is required before useful laws can be laid down for its operative treatment.

It has, I think, been too often assumed that the abdominal complaint made by a patient is necessarily associated with any abnormality which may be discovered. An ovarian cyst the size of a Tangerine orange, free from adhesions and tenderness, has, on more than one occasion, been excised, because the patient complained of abdominal, pelvic, and other pains; yet such a cyst to my knowledge may exist for years without growing or causing any trouble. A kidney, loose enough to be grasped by the hands, or even less displaceable than this, has been fixed for obscure abdominal and general complaints; tucks have been sewn in the sagging stomach, the dislocated liver and spleen have been sutured to the parietes; adhesions of stomach and of ovaries and uterus have been separated; and in nine cases out of ten no real good has been done to the patient, and some discredit to surgery has resulted. No intelligent practitioner or physician will allow that an organic cause is at the bottom of every abdominal trouble, and still less, that surgery is the only treatment for every abdominal ill; and, in advancing claims without strong and reasonable evidence in their favour, there is real danger that surgeons and their work may not continue to be held in the high esteem they now enjoy.

I have already indicated some of the difficulties in the selection of the best time to do an operation in acute cases; the same anxiety arises in chronic ones. My view is, that palliative operations entailing discomfort and a departure from the normal exterior, should be as long as possible postponed. Some years ago, following text-book teaching, I was in the habit of recommending early gastrostomy in œsophageal obstruction, and early colostomy in cancer of the rectum. A few submissive and intelligent persons may be pleased with the results, but the average patient has serious objections to being fed through a hole in the stomach as long as he can swallow, or to defæcating over the iliac fossa, as long as fæces can come through the rectum; and, in my experience, he does not hesitate to express disgust at the result of these operations. If, however, the œsophageal obstruction is complete, and the patient hungry, or if a rectal cancer is blocking the bowel, and symptoms of obstruction are in evidence, no operations will be more appreciated. The delay is not good for operation statistics, but surgery was made for man, not man for surgery, and it is well to remember this in these cases. On the other hand, palliative operations, when no apparent defect is in evidence, such as gastro-enterostomy and intestinal anastomosis, cannot be too soon undertaken, when the need for their performance has been once recognised.

The form of operation to be employed is a subject for grave consideration. The natural desire of surgeons is to do a complete and radical operation, and it is scarcely necessary to emphasise the importance of doing this when it is possible with a prospect of success. In many cases of intestinal obstruction, however, those especially in which the small intestine is distended, a radical operation offers so small a chance of recovery that the attempt to do one should not be entertained. Drainage of the distended intestine, for a time, offers a chance of temporary, or even in some rare cases, of permanent recovery; and at a later date an attempt may be made to remove the cause with a better hope of success.

The complete removal of pancreatic cysts, unless these be exceptionally favourably circumstanced, has been attended by a high rate of mortality; the suture of these to the parietes, followed by prolonged drainage and careful after-treatment, has been followed by a high percentage of recovery. A hopeless looking case of pyonephrosis may be improved by drainage to such an extent as to recover after a secondary nephrectomy. Not only the disease, but its accompanying conditions, and the state of the patient require consideration before a decision can be arrived at as to the best form of operation to adopt in any particular case. The most fatal and disappointing of all forms of operation are those commenced as radical proceedings and terminated, after serious damage may have been done, as incomplete.

Preparation for operation.—The patients are, as a rule, admitted to hospital two days before operation. A careful examination is made of the general condition and of the chest and heart. Special attention is paid to the examination of the urine. In addition to the usual hot bath on admission, they are submitted to the following preparation. On the day before operation, a dose of purgative medicine, usually castor-oil, is administered, and next morning a simple soap and water enema. The skin of the operation area is prepared on the day preceding the operation. All hair is shaved off and the skin first washed with water and spirit-soap (made by mixing together equal parts of soft soap and methylated spirit). The skin is further cleansed with turpentine, then methylated spirit, and finally corrosive sublimate (1 in 1000 watery solution). A cloth soaked in the last-mentioned solution and covered by gutta-percha tissue is bandaged on and remains until removed on the operating table.

In the operating theatre the antiseptic method is the one followed. Boiling ruins instruments, and, except in septic cases, these are not boiled, but, after thorough cleaning with soft soap and hot water, lie in a 1 in 20 carbolic lotion for an hour before use. Instruments, sutures, and the like are handed to the surgeon by a nurse who has this for her sole duty. The carbolic lotion covering the instruments is diluted to 1 in 60 before the operation begins.

The lotions used are, corrosive sublimate 1 in 1000 and 1 in 10,000 aqueous solution, and carbolic acid, 1 in 20.

The site of operation is isolated and surrounded by towels wrung out in carbolic lotion, 1 in 20, on which instruments may be placed during the operation without fear of contamination. The hands of the surgeon, assistants, and nurses, are washed with spirit-soap, turpentine, and methylated spirit, and finally scrubbed with a nail brush in 1 in 1000 corrosive sublimate.

The patient's skin is washed first with 1 in 1000 and then with 1 in 10,000 corrosive sublimate.

During the course of the operation 1 in 10,000 corrosive sublimate is used for the hands of those engaged in it. The assistants and the nurses wear rubber gloves throughout the operation. For mops, gauze previously boiled and stored in 1 in 1000 corrosive sublimate lotion is employed. Before use, the mops are wrung out of hot 1 in 10,000 corrosive solution.

For special cases nothing has been found so satisfactory as sponges, which are kept in 1 in 20 carbolic lotion. These are also wrung out of 1 in 10,000 corrosive solution just before use. Any which have been in contact with septic cases are purified by thorough washing and then steeping for twenty-four hours in pure carbolic. For sutures and ligatures catgut is nearly always used. The chromicised gut is placed for twenty-four hours in ether, and then transferred to a solution of corrosive sublimate in methylated spirit (1 in 1000) for a week. During the operation it is used direct from methylated spirit in which it is kept. For muscles and for the deep sutures of hernia operations, thick catgut is employed, size No. 8, corresponding to No. 19 standard wire guage, and for the skin a finer size, No. 2, standard wire guage No. 25.

Thick through and through silk sutures are used for the abdominal wall in malignant cases, as there is in these a special tendency to rupture of the wound, and in cases for which it is desired to speedily terminate the operation.

Silkworm gut is used to suture the skin in septic cases.

For dressings, boiled gauze kept in a solution of corrosive sublimate in methylated spirits (1 in 1000) until use, is employed. This is wrung out and covered by pads of corrosive wood-wool, and fixed by bandages.

The anæsthetic.—The choice of an anæsthetic is left to a skilled anæsthetist. When I personally am responsible, my preference is for chloroform until the laryngeal reflex is abolished, then ether for the remainder of the operation, unless the respiratory movements become too vigorous, when a return to chloroform is suggested.

The proportion of nurses to patients in the surgical wards is one nurse to eight patients in the male, and one nurse to six patients in the female wards.

AFTER-TREATMENT.—The after-treatment of abdominal operation cases may be considered under the following headings:—

Shock.—A certain amount of shock follows all abdominal operations. Of late years it has been minimised by the methods adopted for its prevention, the most important of which still is to keep the patient warm. Nevertheless, a serious amount of shock may follow severe operations, or operations done upon debilitated patients.

A warm bed is of the greatest importance. The entire bed should be heated before the patient is placed in it, and the body-heat should be maintained by carefully-applied hot bottles and abundant clothing. It is necessary to lay stress upon the careful application of hot bottles, for many and grievous burns have been inflicted upon unconscious patients in the endeavour to restore their body-heat by the too assiduous application of hot bottles; and so easily is this done, that any nurse who has not been specially warned of the danger, and taught in a most emphatic way how it is to be avoided, namely, by abundant woollen wrapping round the bottles, will almost certainly sooner or later come to grief. In ordinary cases, this treatment, namely, the application of warmth and quiet, are sufficient. For worse cases, or for debilitated people, the foot of the bed is raised; the face is rubbed with a dry hot towel; the mouth and pharynx are swabbed with a sponge on forceps, wrung out of brandy; and an enema of 10 oz. of coffee and a teaspoonful of coarse brown sugar is ordered, with $\frac{1}{30}$ gr. of strychnine hypodermically. For the next degree in which the patient is seriously shocked, 1 pint of normal saline (1 drm. of salt to 1 pint of water), at a temperature of 105°, is injected with an aspirator needle attached to a Higginson's syringe, under each pectoral muscle; and when shock has assumed dangerous proportions, and especially if there has been loss of blood, then, in addition to the measures mentioned, from 1 to 3 pints of normal saline are transfused into a vein, usually the median cephalic, and the dose of strychnine is repeated.

Three symptoms follow every abdominal section, namely, sickness, pain, thirst.

Regarding these, I have certain general rules which are followed, except in special instances. Sickness is treated by abstinence from mouth-feeding in ordinary cases. From twenty-four to forty-eight hours after operation, I begin to give the patients small (1 gr.) doses of calomel, repeated from five to ten times, one every hour. This, if retained, aids the passage of flatus, and satisfies the natural craving for some treatment to relieve the discomfort present, a feeling not to be despised. If the patient is comfortable at the termination of the calomel dosing, and especially if some flatus has been passed, we leave well alone; if not, a soap and water enema, about 1½ pints, is ordered. After the colon has been cleaned, if sickness still persists, an enema of 2 oz. of milk, 2 oz. of beef-tea, and 1 oz. of whisky every two hours, is given through a tube and funnel. (The intermittent pumping action of the Higginson syringe irritates the rectum of some patients.) Up to this time, moderate sickness, though the patient has vomited, need cause no anxiety. Vomiting, which persists after this period, especially if it increases on the third day, and if the vomited matter is green and in considerable quantity, is an anxious symptom; for it is often one of the early indications of commencing septic peritonitis, which, though now rare as a sequel of operation, is still a possibility. A tumblerful of hot water, as hot as it can be drunk, with a small teaspoonful of soda bicarbonate in it, is my favourite prescription for an obstinate but not serious vomiting; or, if the bowels have not moved with the enema, a seidlitz powder instead of the soda. For serious vomiting, only one remedy is of any avail, and that is, washing the stomach out through a tube. It is surprising to any one unacquainted with this method how much relief may follow the thorough cleansing of the stomach effected by it in favourable cases. Some patients, however, are intolerant of the tube, and the washing out is therefore incomplete and unsatisfactory; and to persevere in these cases means doing more harm than good. A fair substitute may be found by ordering every four hours a large drink such as previously suggested, or one of weak hot tea, or whisky and potash water; or even, if the craving for it is strong, a glass of beer may be allowed. After the third day, some nervous patients continue to retch and bring up mouthfuls of what they have swallowed. A glass of champagne with a little food, such as a small raw meat sandwich, will sometimes put an end to the trouble; if not, a small hypodermic injection of morphia (⅙ gr.), if the bowels have been well moved, or, if not, 1 oz. of castor-oil may be administered.

Thirst.—The most distressing symptom after the majority of abdominal operations is thirst, for it is the most difficult to relieve. No explanation of it, so far as I know, is satisfactory, and none of the many treatments proposed prevent or cure it. It may be relieved by rectal enemata of warm water, by transfusion or infusion of normal saline, or by leaving saline solution in the peritoneal cavity; but it is never entirely prevented or completely relieved. Water, as hot as can be borne, in teaspoonful doses, frequently repeated, is allowed from the first in all my cases. Ice makes the tongue sore and dry, increases the flatulence already present, and, melting in the stomach, dissolves and promotes vomiting. Nothing is so useful in relieving the thirst as a dose of morphia, the administration of which requires so much careful consideration, that I shall deal with it specially after the consideration of the third symptom mentioned.

Pain.—It may be taken for granted that the pain following abdominal section is greater than is experienced in the ordinary or in most of the extraordinary illnesses of life; and, in my opinion, it is more than patients should be required to bear, unless the strongest possible reasons can be offered to the contrary. Following the lead given by Lawson Tait for several years, I refused morphia, only giving it in the worst cases. Now my rule is ⅓ gr. of morphia hypodermically the first night, but never after.

Morphia.—There can be no doubt that patients who have been treated for a few days by repeated doses of morphia are in every respect damaged, and great difficulty will be found in estimating the extent of the damage, or in forming a reasonable opinion as to their progress. The "sudden bad turn" is most frequently seen in them. A more definite and grave objection to the repeated use of morphia is, that a free action of the bowels is difficult to obtain when the patient is under its influence; and it requires no long experience in abdominal work to convince any one of the paramount importance of this. A single strong dose the first night, however, secures rest and relieves all symptoms, and, so far as I can judge after several years' trial of it, its advantages exceed any possible disadvantages from its use.

Condition of the bowels.—The pain complained of is chiefly of a griping character, and is much relieved by the free passage of flatus. It depends, I believe, upon severe but irregular and therefore inefficient contraction of the muscular coats of the intestines. At an early hour a rectal tube is introduced to aid the passage of flatus; and this the calomel prescribed generally secures before the evening of the second day after the operation. If not, a soap and water enema is likely to produce the desired result, and this may be made more effective by the addition of turpentine. My usual prescription is to administer first 1 oz. of turpentine, suspended in a tumbler of barley water, then 1 pint of soap and water. This may be repeated every two hours till flatus is freely passed. However freely the bowels have acted after these measures, patients usually complain of some abdominal discomfort, look depressed, and have no appetite for food until after the fourth day. Quite seldom do they get rid of these symptoms till after they have had the usual dose on the third or fourth day of 1 oz. of castor-oil. After trying everything less nauseous known to me, I find that I always return to this. Nothing has proved so effective in removing every discomfort. Occasionally diarrhœa follows the operation instead of the usual constipation. In a moderate degree, this may be beneficial and requires no treatment. If the stools are offensive, ½ oz. of castor-oil with 5 minims of tincture of opium is my routine prescription; if not, 5 grs. of pulv. ipecac. co., 5 grs. bismuth trisnit., and 1 gr. of hydrarg. c. creta.

Diet.—My general rule is to allow nothing but sips of hot water by the mouth until flatus has been passed, *i.e.* during the first thirty-six hours or thereabouts. Weakly patients get during this time 2 oz. of milk, 2 oz. salt beef tea, and ½ oz. whisky per rectum, and in the same way if the water swallowed is not retained, a tumblerful of hot water night and morning. As soon as flatus has passed, a cup of tea with cream and sugar if desired, and following that small and gradually increasing allowances of milk and barley water are given. During the first four days fluid diet, and by the end of a week ordinary food is the rule.

Bladder.—If patients can pass urine unaided, as a general rule, they are allowed to do so. The catheter is then unnecessary, and may be harmful. If, however, everything does not seem to be right, it is important to make inquiry as to urination, and to examine the hypogastrium, for it is astonishing how distended a bladder may be without causing definite complaint, in cases where it is only partially emptied, and this is especially true of old people and of women.

The nurse.—Certain nurses have a "knack" of doing well with abdominal cases, and both patient and surgeon are lucky if they get hold of such an one. To be raised comfortably and packed up skilfully with pillows at the back and under the knees into a half-sitting posture for a time, even on the second day, is a great relief to most patients. Rolling over occasionally from the back to one side, then to the other and back again, if it can be done without great trouble (as it can be by a skilful nurse), is a change that most patients are grateful for. A little drink, a little well-timed sympathy and encouragement, even perhaps a gentle reproof on occasion, are things certain to make the difference between a happy and an unhappy patient, and I, for my part, believe that in the worst cases the skilled attentions of an intelligent sympathetic nurse can and do account for the continuance of life and for escape from death.

It is safe to say in the great majority of cases, that the prognosis may be given before the patient leaves the operation table, but it is still more safe to say that seldom anything goes wrong with a patient who has got over the fourth day without untoward symptoms. The fourth day is the critical one after abdominal operations. Sepsis, hæmorrhage, and shock are at the present day dangers of the operation rather than complications after it.

COMPLICATIONS FOLLOWING ABDOMINAL OPERATIONS.—*Peritonitis.* —Though antiseptics and increased skill in the technique of operations have almost abolished septic peritonitis, they have not entirely done so. A septic focus which is already present, and which has successfully resisted attempts to deal with it, may be the centre of a spreading infection and the cause of general peritonitis. In such instances, from the first it may be possible to see that the patient is unlikely to do well, but the more usual course is that nothing extraordinary is noted till the end of the second or third day. The pulse steadily increases in rapidity, a sign of the greatest value in prognosis; sickness and mental depression are present, and some distention of the abdomen, first noticed in the epigastrium, with inability to pass flatus, are the first warnings of the much dreaded peritonitis. From definite general septic peritonitis following abdominal operations, recovery is rare whatever is left undone or whatever may be done. My views as to what should be left undone are decided and may be useful to some one, as they are based upon a not inconsiderable experience of such cases. At one time I held very strongly, on pathological grounds, the view that no one could recover from such a condition except by the help of surgery, and that some might recover if operation could be carried far enough. The consequence of this belief was that I left nothing in the way of cleansing and irrigation and drainage undone; but the result invariably was that, the more completely the operation was performed, the sooner the patient died. I believe now that the question of operation should not be entertained in these cases, and that a small percentage of them do get better if gently helped to do it. The measures I suggest are in the main, treatment of the symptoms, and so long as the abdomen, even though not distended, is not tense, I entertain some hope. A tense distended abdomen is wholly unfavourable.

The first step is, to stop all nourishment and drinks by the mouth, and to cease the administration of purgatives. The next, to wash out the stomach with abundance of hot water, and then to administer a small hypodermic injection (say $\frac{1}{8}$th gr.) of morphia.

Nutriment is to be given by the rectum. Thirst is to be relieved by venous transfusion of normal saline or continuous hypodermic infusion of the same, and marked pain and restlessness by small repeated doses of morphia. The body heat is, so far as possible, to be maintained by artificial heat, and the action of the heart by strychnine, given hypodermically ($\frac{1}{20}$ gr. every six or eight hours). Every day that the victim of general peritonitis lives increases the chance of ultimate recovery. During the whole later part of the illness, it is needful to keep a careful look out for localised collections of pus in the abdomen, for evacuation of these is to be strongly recommended.

Pneumonia.—The prolonged administration of anæsthetics, especially of ether, necessary for abdominal operations, and the inability to cough afterwards, owing to the pain of the abdominal wound, predispose to collections of mucus in the lungs, and to pneumonia. One type of this commences with the operation, and on the following day the patient will have an elevated temperature, a quick pulse, more or less cyanosis, and difficulty in breathing, with moist râles all over the chest. Treatment of this condition, if vigorous and undertaken at once, may put a sudden end to the whole trouble. The patient must be raised up in bed, and held in this position by some one supporting the back; and, whilst the abdominal wound is supported by strong hands on either side, an honest and, if necessary, prolonged attempt must be made by coughing to get rid of the accumulated mucus.

In the more ordinary type, a high temperature, cough with rusty sputum, and the physical chest-signs of pneumonia, are found usually during the first week after operation.

My impression is, that pneumonia following operation in Newcastle Infirmary is much more common than elsewhere (it occurs in about 10 per cent. of my cases); but, so far as I can judge, it is the only serious illness dependent on our overcrowded and insanitary building. Fortunately, the mortality from it is very low, and is almost limited to stomach cases; also, the healing of the wounds of persons attacked appears not to be interfered with by it.

Cystitis.—Several years ago, when it was the custom to pass catheters after every abdominal operation, cystitis was one of the dreaded complications of after-treatment, for it occurred in a considerable percentage of cases, and often recovered only after a painful and prolonged convalescence. During the last five years I cannot recall a single instance of catheter cystitis in a hospital patient. This change is attributable, I think, to two things: first, to the fact that catheters are used with much less frequency, and second, to my teaching that cystitis means a dirty nurse.

Intestinal obstruction.—After every abdominal operation there is a possibility of intestinal obstruction. It is described in all books as arising on occasion from the inclusion of a loop of intestine in the sutures used to close the abdominal wall; but this is a rare and avoidable cause. In nearly every case it arises from adhesions and closure by kinking of the adherent gut, and is most commonly met with after operations for appendicitis, or for the removal of ovarian tumours with twisted pedicle and peritonitis. Fortunately, too, for diagnostic purposes, it seldom occurs during the first week, but commonly during the second and third weeks, when convalescence seems to be assured. If the pain has been severe and paroxysmal, and has been attended by vomiting and wind-rumblings, and visible or palpable peristaltic movements of the intestine, making the diagnosis definite, immediate operation is my rule. If, however, the diagnosis has been less certain, ¼ gr. of morphia, injected hypodermically, is ordered. If the symptoms are removed by this, and do not reappear after eight hours, the condition is probably due to nothing serious; but whether or not, a dose of castor-oil and an enema are given to clear up the remaining difficulty. If the case is one of intestinal obstruction, acute symptoms are produced, and operation is undertaken at once. The results of this plan of dealing with these serious cases has been so satisfactory (see *Lancet*, London, January 31, 1903) as to surpass our highest expectations.

Phlebitis.—The pathology of femoral phlebitis following abdominal operations is ill understood; to some extent, presumably, because few of the patients die. Many, however, are so ill from the attack, and suffer such prolonged incapacity in consequence, that the subject is worthy of further serious consideration and pathological study. My colleague, Mr. W. G. Richardson, has specially interested himself in its onset, and has found that with remarkable frequency it appears about the tenth day after operation. It occurs in both men and women, and after every variety of abdominal and pelvic operation, but selects with very decided preference those suffering from anæmia. As a consequence, the operations most likely to be followed by it are those of hysterectomy, either for fibroids or cancer.

Treatment, once the condition has developed, is unsatisfactory; and beyond complete rest in bed, I know of nothing to hasten recovery. I believe, however, that the onset may be prevented. During the last three years, every hospital patient of mine likely to develop this affection has, at the end of the first week of convalescence, had the legs well rubbed from below upwards twice a day. It is surely safe to regard the fact that no patient has developed phlebitis since this treatment was commenced, as more than a coincidence.

Parotiditis.—This, although a less common complication than phlebitis, still occurred too frequently. After stomach lesions, especially ulcer, it might be expected. Without discussing the pathology, of which I know nothing, I will merely state, that since using frequent gargles and directing the nurse to keep her patient's mouth frequently swabbed with glycerin and borax, it seems to have disappeared.

Ventral hernia.—In a certain percentage of cases, ventral hernia is inevitable, and the evidence of the surgeon who says he never sees it may safely be put aside, for he does not care for the after-history of his patients. The percentage should, however, be very small, and attributable to some special cause, such as unavoidable infection of the wound, or serious illness of the patient, necessitating rapid and unsatisfactory suture. It occurs most frequently in very fat and very thin persons. The use of a belt for a year after operation is recommended by most authorities, but I doubt its usefulness. To avoid strains and sudden jerks during the first weeks of convalescence is of more importance. There is no belt or appliance which will retain a ventral hernia or prevent it from becoming larger; so that, if the patient is in fair health, operation for its cure should be advised.

A CONTRIBUTION TO THE PATHOLOGY OF "BONE CYSTS" IN THE ACCESSORY SINUSES OF THE NOSE.

By A. Logan Turner, M.D., F.R.C.S.Ed., *Surgeon for Diseases of the Ear and Throat, Deaconess Hospital, Edinburgh.*

(*Concluded from Vol. XIV. page* 526.)

Bone Cysts in connection with the Antrum of Highmore and the Superior Maxilla.—In studying the subject of osseous cysts in connection with the antrum of Highmore, it is necessary to bear in mind that we have to deal not only with their development in relation to the sinus, but also in connection with that part of the superior maxilla which does not contain the cavity of the antrum. The explanation of this is to be found in the fact that the cysts develop in connection with the different teeth of the upper jaw, and in consequence of this they may originate in any part of the alveolar portion of the bone. The study of the subject of antral cysts therefore would not be complete nor indeed intelligible without due consideration being paid to the question of cysts of dental origin.

It is not our intention to enter here into the much-discussed problem of the origin of tooth cysts and their relation to first and second dentition, because we have had no opportunity of throwing any fresh light upon it. A great deal has been written in this connection, and various theories have been evolved: it is especially to the French school of writers, to Magitôt and Malassez, to

Vernueil, Reclus, Dupuytren and Albarran, that we owe most of our knowledge regarding this part of the subject. We will endeavour rather to discuss the question in its clinical bearing, illustrating, where it is possible, the more important clinical features by means of descriptive cases, and demonstrating such pathological points as may be necessary for a better conception of the condition.

If the French writers have studied the etiology and early development of tooth cysts, Zuckerkandl[1] has helped to make clear many points that were previously misunderstood regarding their growth and anatomical relations. The clinical appearances will probably be more readily interpreted if some reference be made in the first instance to the manner in which the tooth cysts invade the jaw. They may be met with in any of the tooth areas, consequently their relation to the neighbouring cavities, such as the maxillary antrum, the nose and the mouth, will be dependent partly upon their seat of origin and partly on the size which they may attain. Thus, cysts of the incisor teeth lying immediately beneath the nose encroach upon the nasal floor and the hard palate as they increase in size. If in connection with the canine tooth, which is placed rather more laterally, and which lies at some little distance in front of the antrum, the cyst may become evident on the palatal aspect of the bone. In the case of the biscupids lying in close contiguity to the antrum, the cyst may expand the facial wall of the alveolar process and give rise to a swelling which may show itself upon the upper lip and lower part of the cheek. In its growth such a cyst may press upwards the floor of the antrum and thus encroach upon that cavity; it is, however, in connection with the molar teeth that the cyst enlarges most frequently at the expense of the maxillary sinus. As it grows and presses upwards the floor of the antrum, the latter becomes in consequence much reduced in size; in one of Zuckerkandl's cases, the vertical diameter of the antrum was reduced to 9 mm. The facial wall of the sinus is at the same time expanded and thinned, and may form a swelling of considerable size upon the cheek. Occasionally the cyst develops in the interior of the antrum, and reaches a very considerable size without there being any evidence upon the surface of the jaw of its existence.

Some of these points are well illustrated in Figs. 1 and 2, both of which are copied from Zuckerkandl's well-known work.[2] Fig. 1 is a vertical transverse section through the nasal cavities and maxillary antra of an adult male, and are viewed from behind. The lower part of the left antrum is occupied by a bony cyst which reduces very considerably the size of the sinus. There is no communication between the two cavities. The facial wall of the superior maxilla is bulged out-

---

[1] "Norm. u. Path. Anat. d. Nasenhöhle."

[2] *Op. cit.*

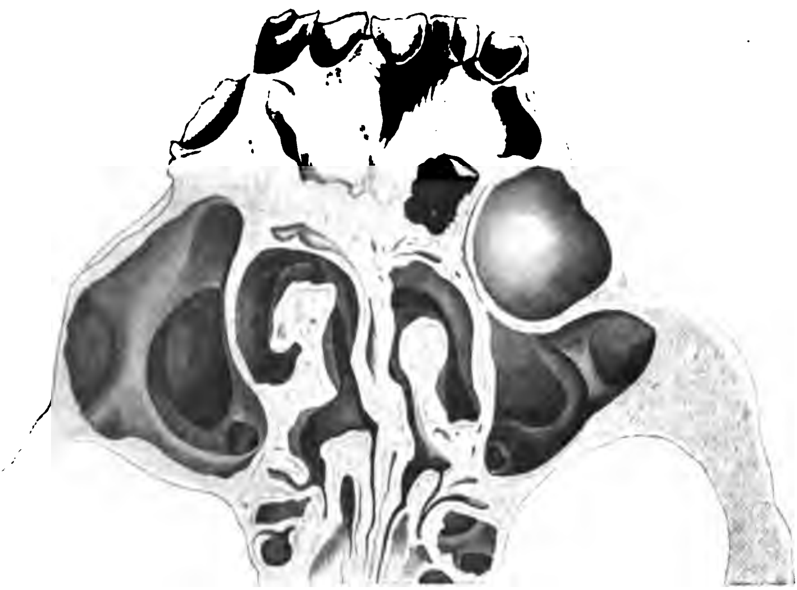


FIG. 1.

wards, the bone is thinned and yields under the pressure of the finger. The nasal cavity on the same side is encroached upon by the swelling, the outer wall of the inferior meatus being flattened instead of hollowed upon its nasal aspect, while the inferior turbinated body comes to occupy a higher position than its fellow on the opposite side. Zuckerkandl considered that the cyst originated in connection with a supernumerary tooth in the region of the second molar. On the same side of the jaw, there is a second cyst which lies in front of and below the first. It is the size of a small hazel-nut, and the canine tooth, which is carious, is seen to project into the small cyst cavity. There is bulging of the hard palate in the region of the canine, and the floor of the left nasal

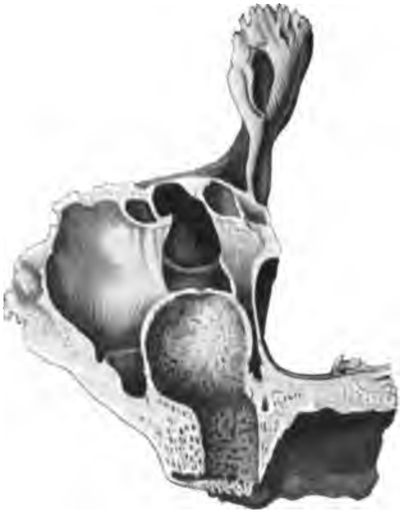


FIG. 2.

chamber occupies a somewhat higher level than the nasal floor of the opposite side.

Fig. 2 is also a transverse, vertical section through the left superior maxilla, and is viewed from behind. In this specimen there is no external evidence of the cyst contained in the cavity of the antrum. The teeth have disappeared from the jaw, but the socket of the second molar leads upwards into a cavity, the size of a hazel-nut, which projects for some distance into the maxillary sinus. There is no communication between the two cavities, though the walls of the cyst are thin and porous.

The two following cases are examples of cysts of the upper jaw which present clinically some of the points to which we have just drawn attention. In each of them, the cyst occupied the part of the jaw anterior to the antrum, and probably in neither case encroached upon the latter cavity.

Case 7.—J. C., a lad, æt. 16, was sent to me by Dr. Haldane of Bridge of Allan, in June 1903, complaining of a swelling upon the left side of the face, situated in the region of the naso-labial fold. He had first noticed it nine months before: it had never caused him any pain or discomfort. Shortly after noticing it, he had consulted a dentist, who incised the swelling through the buccal mucous membrane. Some fluid was evacuated, and for a period of time there was considerable diminution in its size. In February 1903 he again saw a dentist, who removed the left upper lateral incisor, but without causing any alteration in the size of the swelling. The patient had suffered no inconvenience from his teeth, and he believed that the incisor which was extracted was a healthy tooth, but proof of this was wanting. He gave no history of any nasal trouble.

On examination, there was readily visible some fulness of the upper lip on the left side, the swelling extending upwards on to the face and filling up the left naso-labial fold. It was apparent as far upwards as a point corresponding to the junction of the nasal cartilage with the bone, while externally it reached a plane corresponding to the position of the infra-orbital foramen. There was no tenderness on palpation. On turning up the lip, one could observe lying ¼ in. above the lower edge of the gum a swelling covered with normal mucous membrane, and extending from the frenum of the lip backwards along the facial aspect of the alveolus as far as the interval between the second bicuspid and first molar teeth. On palpation it was found to be of a semi-solid elastic consistence, but there was an absence of any parchment-like crackling. All the teeth in the upper jaw appeared sound; the wisdom tooth had not erupted, and there was a gap in the position of the extracted left lateral incisor. There was no bulging in the hard palate. On anterior rhinoscopy there was visible just beyond the vestibule, a small swelling partly occupying the floor and in part the outer wall of the left nasal chamber. In the latter situation, it lay immediately below the anterior end of the inferior turbinated body, and was formed by a bulging of the outer wall of the inferior meatus into the nose. Pressure upon the nasal prominence with the probe caused it to yield slightly. Transillumination of the antra was carried out, and it was interesting to observe that the antrum on the right side failed to illuminate, while that upon the left side illuminated very well. The area of the swelling was also mapped out by the illumination offering a contrast to the shadow, which was evident in the corresponding area upon the right side of the face.

With the assistance of Dr. Alexander Mackintosh, I made a horizontal incision over the buccal swelling, raising the mucosa and periosteum. The underlying bony wall was extremely thin, and when divided a quantity of perfectly clear fluid escaped. It contained no glistening particles, such as one finds associated with the presence of cholesterin crystals. The cavity was about the size of a pigeon's egg, and was lined by a perfectly smooth membrane, which could be stripped off the bone with comparative ease. The posterior wall of the cyst possibly encroached slightly upon the cavity of the antrum, but there was no communication between the two cavities. The whole of the prominent anterior wall of the cyst was removed with forceps, the lining membrane detached, and a counter-opening made into the nose through that portion of the cyst wall which bulged into the nasal cavity. The cyst was packed with worsted, and the buccal wound closed with the exception of a small opening, which was left for the purpose of syringing through the cavity. This was deemed advisable, as the nasal opening was in the highest part of the cyst. After removal of the plug upon the fourth day, syringing was carried out daily; at the end of a month both nasal and buccal wounds had healed, there was no evidence of a cavity remaining, and the swelling on the face had disappeared.

Examination of the fluid showed that there were no cholesterin crystals present, nor were there any pus cells. In this case no infection of the cavity had followed the previous incision into it. It was unfortunate that the bony wall and lining membrane, which were preserved for histological examination, were mislaid, so that the material was thus lost.

Case 8.—L. M., a medical man, æt. 40, noticed for the first time, in the beginning of March 1902, a slight prominence in the left naso-labial fold. On palpation through the lip, the swelling somewhat resembled a marble, presenting a smooth, rounded surface, hard to the touch, but not painful on pressure. When the lip was everted, the swelling was found to occupy the buccal aspect of the alveolus half an inch above the lower margin of the gum, and situated immediately above a diastoma previously occupied by the left second bicuspid tooth. This had been extracted some years previously. Two or three weeks later considerable pain was complained of in the swelling, so as to cause the patient to seek advice. He was examined by his dentist, Mr. Morris Stewart, who further detected a slight bulging of the hard palate opposite the first bicuspid tooth. The palatal prominence yielded slightly to pressure, but no fluctuation could be detected through the bone between the palatal and facial swellings.

An incision was made above the alveolus, and immediately there escaped, as if under pressure, a jet of fluid having a brown colour and containing a number of glittering particles, in all probability cholesterin crystals. The relief thus obtained was only of short duration, the cyst cavity rapidly refilling, causing tension and pain. A second opening was necessary, and it was then found that purulent infection of the cavity had taken place, pus being evacuated. On probing, the cyst was found to be more or less spherical in shape, and about the size of a small hazel-nut, and lined by a smooth membrane. In the lowest part of the cavity the probe came in contact with a small rough area somewhat difficult to palpate, which did not at this time feel like an exposed tooth fang. The patient referred this area to the situation of his first bicuspid. The first upper molar tooth was dead. The cyst wall was otherwise intact: it seemed extremely doubtful whether the cavity was of sufficient size to encroach upon the antrum. Both antra illuminated equally, and anterior rhinoscopy revealed nothing abnormal in the nose. A portion of the anterior bony wall of the cyst was removed, the cavity curetted and swabbed out with pure carbolic acid, and then plugged.

Notwithstanding some diminution in the size of the cyst, it became evident that healing would not take place without the extraction of the tooth which was the causal factor. Considerable difficulty was experienced at first in arriving at a correct conclusion as to which tooth was at fault. It was often difficult to probe the area above referred to, and when one succeeded in doing so, the patient was confident that it was in contact with his first bicuspid tooth. On more than one occasion the direction taken by the probe appeared to confirm his statement. Finally, however, it was evident that the first molar was at fault. This was extracted, and the small opening between the palatal fang of the tooth and the cavity of the cyst was enlarged. This was packed with gauze, and in the course of three or four weeks the cyst had disappeared. At the base of the palatal fang a small area of periostitis was observed.

The next case is an excellent example of a large cyst encroaching upon the cavity of the antrum, diminishing the size of the latter cavity, and expanding its facial wall. The patient came under the care of Professor Annandale in the Edinburgh Royal Infirmary, and I am much indebted to him both for the opportunity of examining it and for permission to record it here.

Case 9.—W. K., a boy, æt. 13, was admitted into Ward 7 in December 1903. According to the statement of the boy's mother, a swelling was first observed on the left side of the face three months before admission. The patient himself was not aware of its presence until he had his attention drawn to it, so it is quite possible that some degree of swelling had existed for a longer period of time. It gave him no pain or discomfort, but it reached a very considerable size, causing a good deal of disfigurement. There was no history of an injury, nor had he suffered from any nasal discharge. With the exception of measles in earlier childhood, he had had no illness.

Examination revealed the presence of marked fulness of the left cheek, which was, however, covered with skin of normal appearance, which was freely movable over the swelling. It extended upwards as high as the infra-orbital margin, and posteriorly it appeared to blend with the malar prominence. Anteriorly it reached as far forwards as the junction of the ala nasi with the upper lip, while inferiorly it extended almost as low as the plane of the angle of the mouth. On everting the upper lip, there was at once visible upon the facial aspect of the jaw a prominent swelling, covered with normal mucous membrane, extending from the canine ridge in front to just behind the second molar tooth. Its lower limit was about a quarter of an inch above the margin of the gum. The alveolar edge of the superior maxilla appeared broadened out, and there was a slight fulness on the palatal aspect of the bone opposite the bicuspid and molar teeth. This fulness did not give the feeling of bone expansion, there being no elasticity or crackling sensation produced on pressure. Palpation of the cheek over the more prominent part of the swelling gave a hard resisting sensation, but anteriorly and inferiorly it was distinctly of an elastic nature. When pressure was applied to the facial aspect of the alveolus, the bulging wall could be slightly indented, a semi-fluctuating feeling being produced, as if one was pressing upon the lid of a tin, but without any crackling. The dentition was normal, and all the teeth in the left upper jaw appeared to be healthy, with the exception of the first molar, which was a carious stump. The left nasal cavity was almost completely obstructed at the time of examination by a large turgescent inferior turbinated body; but there was no evidence of any undue prominence of the outer nasal wall. On transillumination, the left side of the face illuminated more brightly than the right, though the illumination was not of the marked intensity which one has seen in at least two similar cases.

In this case, the diagnosis of a large dental cyst encroaching upon the antral cavity, and expanding its facial wall, was confirmed at the operation. The cyst wall was punctured by Mr. Annandale with a trochar and cannula, and the fluid contents were in this way collected in a sterile tube. Part of the anterior bony wall of the cavity was removed and preserved for microscopic examination. The lining membrane was curetted, and the diseased first molar tooth extracted. After removal of the tooth, it was found possible to pass a probe upwards into a second cavity, which was clearly the antrum very much constricted by the encroachment of the cyst. With the probe in the antrum and the finger in the cavity of the cyst, the existence of two cavities, separated from each other by an intact bony wall, was clearly demonstrated. The lining membrane of the cyst was scraped, and the cavity plugged.

The fluid evacuated more than filled an ordinary test tube: it was of a pale straw colour, but somewhat turbid in appearance, and was evidently loaded with cholesterin crystals, to judge from the glistening appearance which it presented. Microscopic examination showed that the fluid was of the nature of an inflammatory exudation, and was due to bacterial infection. It contained many polymorphic cells, and in addition to these a number of large phagocytic cells, some of them containing in their interior a considerable number of the polymorphic cells. There were also pus cells present, although to the naked eye the fluid did not present any characteristic appearance of pus. Bacteriological examination of the fluid demonstrated the presence of micro-organisms. A coccus somewhat resembling the *Staphylococcus pyogenes albus* was recognised, and a small bacillus not unlike the pseudo-diphtheritic form.

The three cases just recorded are good examples of the cystic conditions that may be met with in connection with the teeth in the superior maxilla, and they illustrate clinically the anatomico-pathological points with which we introduced the subject. Cases 7 and 8 are examples of tooth cysts occupying the bone independently of the antrum: in both, the swelling was evident upon the facial aspect of the bone, while in the first the nasal cavity was encroached upon, and in the second there was some bulging of the palate. It is probable that in Case 7 the cyst originated in connection with the lateral incisor tooth, though proof of this is wanting, while in Case 8 there was no doubt that the condition started in connection with the first molar.

In Case 9, however, we have to deal with a cyst involving the cavity of the antrum. That the cyst cavity was quite distinct from the sinus in this case, and merely encroached upon it, thus diminishing its size, was satisfactorily proved after the extraction of the carious first molar tooth. A probe entered a second cavity through the tooth socket, and could not be palpated by the finger in the cyst. Further, careful examination of the cyst failed to reveal any evidence of a communication between it and the nose. Killian[1] draws attention to the difficulty of differentiating clinically between a collection of fluid in the antrum itself, or in the cavity of a cyst in this situation. The fact that no communication can be made out between the cyst and the nasal chamber is not sufficient proof, he thinks, that the former is a cavity distinct from the antrum. It is necessary to establish the fact that a second cavity is also present. This was done in Case 9. Billroth also was able to satisfy himself of the existence of two cavities in a case upon which he operated; this he did by perforating the roof of the cyst and entering a second cavity, which was undoubtedly the upper part of the antrum which had not been encroached upon.

Histological evidence of the existence of two cavities distinct from each other has been furnished by Heymann.[1] This writer describes an interesting preparation of a large cyst which filled the greater part of the antral cavity. The latter was anatomically very large. The lining membrane in the part of the cavity which still existed showed no evidence of inflammation, and the ostium maxillare presented a normal appearance. The whole circumference of the lower part of the sinus was occupied by a cyst which extended upwards and filled the antrum with the exception of its upper and posterior part. The wall of the cyst was about 2·5 mm. thick, and consisted for the most part of dense connective tissue in which there was a thin layer of bone. The outer antral surface of this wall was covered with ciliated epithelium similar to the normal epithelial lining membrane of the antrum. On the inner surface of the cyst no epithelial covering was present: it was lined by a pyogenic membrane; the cavity contained a dirty brown fluid, which, however, was not examined microscopically. Coakley[2] records a case of cyst of the upper jaw, in which microscopical examination of part of its wall taken from the vault of the cavity demonstrated a condition very similar to that described by Heymann. In the centre of the tissue there was a lamella of bone, on the outer antral aspect of which was seen the normal mucous membrane of the interior of the antrum, containing glands and covered with ciliated epithelium. On the deeper aspect of the bone was the lining membrane of the cyst proper. There were no glands present in this, and the epithelium was arranged in two or three layers of flattened pavement cells.

---

[1] *Op. cit.*

Difficulties in diagnosis arise not only with regard to the differentiation between cysts arising in connection with the teeth and encroaching upon the antrum and true expansion of the antral cavity itself, but also between cystic and solid tumours and between cysts which have suppurated and chronic suppuration of the antrum. The following case, which was also under Professor Annandale's care, and to whom I am again indebted for the opportunity of examining it, was probably one of fibrous odontome, which in some respects resembled a cystic tumour of the upper jaw.

Case 10.—K. M., a girl, æt. 14, was admitted into the Royal Infirmary in June 1903. She was considerably disfigured by a prominent swelling of the left side of the face. It was observed as a small lump, twelve months before admission, and although it had at first enlarged somewhat slowly, during the last two months it had increased more rapidly. She had never suffered any pain. There was no enlargement of the glands, and no nasal discharge. The skin was not discoloured, nor was it adherent to the deeper structures. The swelling, which occupied the whole of the left cheek, was most prominent over the anterior wall of the antrum. Towards the mesial plane it appeared to involve the frontal process of the superior maxilla—it was limited above by the infra-orbital margin, and there was no thickening or expansion of the antral roof. The eyeball was not displaced. On everting the lip, the swelling was seen to bulge prominently and fill up the gingivo-labial depression extending from the nose backwards to the second molar tooth. There was considerable bulging of the hard palate on the left side, the swelling anteriorly crossing the mesial plane, but becoming less marked posteriorly, where it terminated opposite the second bicuspid tooth. The left ala nasi and the vestibule were somewhat distorted, the swelling blocking the left nostril and pushing it inwards and upwards. The swelling in its greater part was of firm consistence; on the palatal aspect, however, it yielded somewhat on pressure, and in one limited area, situated posteriorly upon the facial aspect of the alveolus, it presented a somewhat elastic feel. When one finger was placed externally upon the cheek and another under the lip, an impression as of elasticity was obtained. Dentition was normal, but there was a diastoma at the site of the first left bicuspid: there was a history of previous tooth extraction. On transillumination, a dark shadow of considerable density was observed upon the left side of the face.

---

[1] *Virchow's Archiv*, 1892, Bd. cxxix.

[2] *Trans. Am. Laryngol. Assoc.*, 1903.

Although the appearances in this case resembled somewhat closely those observed in Case 9, it was found at the operation that the left antral cavity was considerably distended by a solid tumour of fibrous consistence which occupied the interior of the sinus, and which it was found possible to enucleate. The distended wall of the antrum was in part removed and in part pushed into the cavity. The patient made an excellent recovery, only a very slight deformity of the face persisting. Microscopic examination of the tumour showed it to be a fibrous one containing a considerable number of blood vessels. The evident expansion of the bony walls of the superior maxilla, both on the palatal and facial aspects, and the feeling of elasticity which was conveyed to the finger on palpation, made the diagnosis somewhat uncertain. The opacity of the left side of the face obtained on transillumination certainly suggested the solid nature of the swelling, as it presented a distinct contrast to the bright character of the illumination frequently observed in swellings of a cystic nature in this region. It must be remembered, however, that in every case of cystic expansion involving the antrum, bright illumination is not obtained. Its intensity will vary with the degree of thinning of the walls and with the character of the contained secretion. The fluid may be of a clear translucent nature, or it may be of a turbid thicker consistence, which will not transmit the light rays so satisfactorily. In Case 9, illumination of the cyst was obtained, but its intensity was not very much greater than that of the opposite normal side, due doubtless to the fact that the fluid contained in it was turbid. In cases where some doubt exists as to the exact nature of the swelling, a preliminary puncture is advisable.

Considerable confusion sometimes arises in connection with the diagnosis between suppurating cysts encroaching upon the antral cavity and chronic suppuration in the antrum itself. The next two cases are recorded with the object of illustrating certain points in this connection.

Case 11.—W. X., a male, æt. 28, was sent to me by Mr. Amoore in March 1903. The patient had first consulted his dentist in April 1901, on account of a bad-tasting purulent discharge, which passed into his mouth from a small opening situated on the facial aspect of the alveolus immediately above the first upper molar tooth on the left side. Pressure upon the cheek, he stated, caused an increased flow through the opening. The discharge had troubled him for nearly two years. There had never been any discharge from the left nostril. Mr. Amoore extracted the first molar tooth, perforated its socket, and fitted an obturator into the cavity. The patient syringed the cavity daily. This was carried out more or less consistently for two years, without complete cessation of the discharge. On no occasion did the lotion pass into the nose, but always returned through the alveolar track into the mouth.

When I examined him in March 1903, I found, on removing the obturator, that a probe could be passed vertically upwards for a distance of 1¼ in. into a cavity from which a small quantity of pus was washed out. The lotion returned into the mouth. The left nasal cavity showed nothing abnormal, and the patient was certain that he had never had any nasal trouble. On further examination, it was found that the canine fossa was occupied by a bony prominence, which did not yield on pressure. On the palatal aspect of the alveolus on the same side a slight fulness was visible, which was also of an osseous though not of an elastic consistence. There was no visible swelling of the cheek. Both the antra illuminated, but on the left side the area of light was not so bright as upon the right. A subjective light sensation was present in both eyes. No further operation has as yet been carried out upon this patient.

Case 12.—Y. Z., a domestic servant, æt. 30, was sent to me by Dr. Lovell Gulland in March 1901, on account of swelling of the left cheek and a sinus discharging into the mouth. She had first become aware of the swelling in the cheek six or seven years before I saw her. It increased in size after it was first noticed, and three years later she became aware of discharge passing into the mouth from a small opening in the gum. This continued more or less constantly, and she became conscious of a disagreeable taste associated with it. On several occasions the opening closed, a circumstance which was followed by marked swelling of the cheek and lower eyelid. She was able to relieve this condition by pressure upon the cheek, the opening again becoming patent and the discharge escaping. With the exception of occasional shooting pains, she did not suffer any discomfort. At no time in the history of the case was there any discharge from the left side of the nose.

On examination, the left cheek presented a very obvious swelling, extending from the infra-orbital margin downwards on to the upper lip. The disfigurement thus produced was considerable. On palpation in the area of the canine fossa, one found a prominent bony swelling, of a somewhat elastic consistence, and with a slight tendency to crackling when pressed upon. The swelling appeared to extend upwards upon the anterior aspect of the upper jaw-bone as far as the infra-orbital foramen. There was no bulging upon the palatal aspect of the jaw. On the facial aspect of the alveolus, situated a short distance above the second bicuspid tooth, there was a small sinus discharging a somewhat thin purulent secretion. A probe passed into this entered a cavity of very considerable size. By means of a fine syringe, the cavity was irrigated, but none of the fluid passed through into the nose. Anterior rhinoscopy revealed an absence of any abnormal condition. Both left upper bicuspid teeth were carious; the dental condition otherwise was normal. Transillumination showed that the left antrum illuminated with considerable brightness.

This case was very similar to the previous one, but the swelling was much more marked, and caused considerable disfigurement. Under general anæsthesia, a horizontal incision was made through the mucous membrane covering the swelling above the alveolus. The underlying bone was so thin that in stripping the periosteum it gave way. The opening thus made was enlarged with cutting forceps, and the greater part of the bulging bony wall was removed. The cavity was a large one, apparently occupying the greater part of the maxillary sinus. No communication with the nose could be obtained. Both pre-molars were extracted. The lining membrane was curetted, the cavity plugged with worsted, and the buccal mucous membrane sutured, with the exception of a small hole through which the end of the packing could be extracted. The cavity was syringed for some weeks, after which the wound was allowed to close. I had an opportunity of examining the patient two years later, when all trace of the swelling had disappeared and the wound was closed. Both antra illuminated more or less equally.

In the two cases just recorded, we have to note the existence of a bad-tasting purulent discharge passing into the mouth from a large cavity in the situation of the antrum of Highmore. This is a clinical symptom which is so well known in connection with chronic antral abscess that the possibility of an error in diagnosis is not to be wondered at. Both cases, however, more especially Case 12, present features which are sufficiently characteristic to enable us to distinguish between the purulent infection of a cyst and chronic suppuration in the maxillary antrum. Mistakes in diagnosis are not infrequent, but I believe that both these cases must be included amongst the suppurating cysts of the upper jaw, which have encroached upon the antral cavity. An interesting paper upon the differential diagnosis of these two conditions has been written by Kunert.[1] The feature which is undoubtedly of the greatest diagnostic value is the expansion of the bony wall of the antrum, with preservation of the general contour of the parts. When this is present, it may be regarded with certainty as evidence of the existence of a cyst. The facial, alveolar, and palatal surfaces should be very carefully examined, with the object of ascertaining whether there is distension in any of these areas. If the bone has become thinned, and yields upon pressure, or if the sensation of crackling is present, we have further proof of the cystic nature of the affection. In Case 11, both on the facial and palatal aspects of the alveolus, there was slight evidence of expansion of the bone, and in Case 12 the facial appearances were very characteristic. I have never seen a case of chronic antral suppuration associated with distension of the walls of the antral cavity. Kunert lays considerable stress upon this point.

---

[1] *Arch. f. Laryngol.*, Berlin, 1898, Bd. vii.

Again, in both the cases, spontaneous perforation of the facial wall of the cavity had taken place with the formation of a permanent fistula. In one, the fistula had existed for two, in the other for three years. In both it had formed in an area in which the bone had expanded and then become thinned, and it is interesting to note in this relation that both patients were able to expel the discharge from the opening by pressure upon the cheek. This fact is additional evidence of the expansion and thinning of the bony wall. The existence of a fistula is therefore further proof of the cystic nature of the condition. We do not see it occurring in simple antral abscess. As Kunert points out, however, part of the wall of the antrum may be destroyed and a communication exist between that cavity and the mouth as a result of suppurative processes in connection with disease of the teeth or in consequence of tuberculous or syphilitic disease of the jaw, or as the result possibly of trauma and subsequent necrosis. In these cases, however, the bone condition forms the prominent clinical feature, while the antral suppuration is only a secondary symptom in connection with it.

The absence of any communication between the large suppurating cavity and the nose in Cases 11 and 12 must, I think, be regarded as further evidence of the cystic nature of the affection. In Case 12 it was impossible to distinguish upon the inner surface of the cyst cavity at the time of the operation any evidence of a communication with the nasal chamber. Throughout the whole history of the affection, according to the statement of both patients, there was no history of any nasal symptoms. It must be borne in mind, on the other hand, that a purulent discharge from the nose does not weaken the evidence in favour of a cystic condition, because the cyst as it grows and expands may rupture into the maxillary sinus so that direct communication between the two cavities may arise, and the contents of the cyst will in this way drain into the nose. Should the surgeon establish a communication between the mouth and the cavity, and find that the contents are evacuated into the nose, the possibility of erroneously diagnosing the affection as chronic antral suppuration can be readily understood, unless careful observation is made as to the existence of expansion of the bony walls.

It is true that neither in Case 11 nor in Case 12 was any attempt made to ascertain whether a second cavity existed. Such a procedure did not appear to be necessary. Partsch[1] has, in some cases where a purulent fistula existed and where the conditions made it possible, extracted the third molar tooth upon the affected side and opened into a second cavity, namely, that part of the antrum which had not been encroached upon by the cyst. He then syringed through it into the nose, the lotion passing out free from any evidence of pus. Under such circumstances very positive proof of the existence of two distinct cavities was furnished him.

It might be argued that in some of these cases we had to deal with a collection of fluid in the antrum itself, causing expansion of the walls of the cavity with subsequent perforation of the thinned facial wall. In other words, that a condition of so-called hydrops antri Highmori existed, due to occlusion of the natural opening of the sinus into the nose. Considerable discussion has from time to time arisen with regard to the possibility of the occurrence of a pathological condition of this nature. There is no doubt that many cases have been described as cystic distension of the antrum in which the true nature of the case, namely, the encroachment into the antrum of a cyst of dental origin, has not been recognised. Killian[2] appears to accept the occurrence of true distension of the antrum. He states that the less acute serous, mucous, and purulent inflammations can bring this about, causing distension and thinning of the bony walls, but he admits that on account of the rarity of the condition, the anatomical changes which take place are not easy to study. He refers to one of Zuckerkandl's[3] preparations in support of the occurrence of a pathological condition of this kind. The specimen was removed from an old person, and presented the following appearances. The nasal mucous membrane showed evidence of chronic catarrh. The outer wall of the middle meatus of the nose upon the right side bulged towards the nasal cavity. There was no ostium maxillare visible, and the mucous membrane of the uncinate process passed without interruption on to the bulla ethmoidalis, thus closing in the infundibulum. The right antrum contained a large quantity of thick pus, its mucous membrane was swollen, and the mucous glands showed in parts evidence of cystic degeneration. The normal nasal opening of the cavity was occluded.

A preparation of greater interest than the above, and one which undoubtedly throws some light upon the occurrence of distension of the antral cavity, is described in some detail by Dmochowski.[1] A brief résumé of his description may be given here with advantage. The subject was a young woman who had died from endocarditis. On the left side the ostium maxillare was completely obliterated. When the antrum was opened into, there escaped 30 cms. of a transparent yellow fluid, which entirely filled the cavity. The lining membrane was pale and thin, but on the inner nasal wall, in the situation of the obliterated ostium, it was thickened. The sinus walls were so thin that they could be indented on the slightest pressure, and the cavity illuminated in a conspicuous manner. In one corner of the sinus there was a mucous polypus the size of a hazel-nut and attached by a long pedicle. It contained 2 cms. of the same kind of fluid which was found in the antrum. Microscopic examination of the lining membrane of the antrum showed that the epithelium had disappeared. The mucosa consisted entirely of a very thin layer of compact fibrous connective tissue. No mucous glands could be found. In the region of the obliterated ostium, epithelium was found, but it was flattened and devoid of cilia. There were many blood vessels in the mucous membrane, with wide lumina and thickened walls. The fluid from the antrum contained fine threads of fibrin forming a network, in the meshes of which was a serous fluid which did not precipitate on the addition of acetic acid. There were no micro-organisms found.

---

[1] *Deutsche Monatschr. f. Zahnr.*, Leipzig, 1893.
[2] "Heymann's Handbuch d. Laryngol.," S. 1047.
[3] "Norm. u. Path. Anat. d. Nasenhöhle," Bd. ii.

Dmochowski is inclined to support the view that a hydrops of the antrum of inflammatory origin occurs. He argues along the following lines: In all probability it originates in a catarrhal inflammation both of the antrum and of the nose. In consequence of this, the ostium maxillare becomes obliterated. The nasal condition resolves, but in the antrum, on the other hand, it persists, as there is no free outlet, and the fluid gradually accumulates in the cavity. As a result of this, certain changes take place within the antrum. From the pressure of the fluid the lining epithelium and its cilia disappear, the mucous glands become atrophied, and the mucosa itself becomes fibrous. Mucus is no longer secreted, and in its place there is a serous fluid containing fibrin, evidence of the continued existence of the inflammatory process. Further changes consist in the thinning and distension of the bony walls.

We have already seen in the earlier part of this paper that changes of a somewhat similar nature to the above were observed in connection with distension of the middle turbinated air cell, and we have accepted in the cases of distension of the frontal air sinus, an origin depending upon closure of the ostium frontale, associated with a chronic inflammatory process. At the same time we are inclined to the view that in the case of the antrum of Highmore, a pathological condition such as that described by

---

[1] *Arch. f. Laryngol.*, Berlin, 1895, Bd. iii.

Dmochowski is one of extreme rarity, and that the great majority of the cases in which the walls of the antrum become distended are really examples of cysts of dental origin growing into and encroaching upon the cavity of the sinus. We are all aware of the great frequency of catarrhal conditions of the nose, and how comparatively common an inflammatory affection of the antrum is, yet how seldom, if ever, are the pathological appearances described by Dmochowski met with.

Zuckerkandl has dealt with this question, and considers that distension of the antrum from an accumulation of serous fluid is outside the range of discussion, and that the numerous statements regarding hydrops antri relate in general to cases which have been wrongly interpreted. Cystic polypi growing from the antral mucous membrane, and cysts formed in connection with the ducts of the mucous glands, do not lead to distension of the bony walls of the maxillary sinus. If a true distension of the antrum took place, we would naturally expect to find, as Zuckerkandl points out, that the inner nasal wall of the cavity yielded first to the pressure of the contained fluid. The outer wall of the middle meatus is the weakest part of the boundaries of the sinus, the roof of the cavity or floor of the orbit taking an intermediate position between it and the facial wall. Clinical experience goes to show that it is in the region of the canine fossa or facial wall that expansion most frequently takes place: in Cases 11 and 12 there was no evidence of any expansion, either of the nasal wall or of the floor of the orbit, thus affording further proof of the dental origin of the cyst in these cases.

It is evident, therefore, that in almost every instance expansion of the walls of the antral cavity results from the development and growth of cysts, arising in connection with the teeth and encroaching upon the cavity of the sinus. Distension of the antrum itself is an extremely rare condition, if indeed it is ever met with clinically. All the five cases of cyst here recorded were instances of the former, and it is interesting to note that in each case the cyst affected the left superior maxilla.

In conclusion, I wish to thank Mr. Richard Muir of the Pathological Department of the University of Edinburgh for the drawings of the middle turbinated bone on Plate VI., and for his assistance in the preparation of the microscopic work.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

◆

A Treatise on the Diseases of the Anus, Rectum, and Pelvic Colon. By JAMES P. TUTTLE, A.M., M.D., Professor of Rectal Surgery in the New York Polyclinic Medical School. New York and London: D. Appleton & Co.

THE question of how far the modern tendency to subdivide the subjects of general surgery into minor specialities, limited to the study of individual regions and organs, is for the good of medical science as a whole, is perhaps one which is still open to discussion. This tendency has been less manifest in our own country than in America and in some of the countries of the Continent, and our inherent distrust of it may to some extent be merely the result of an insular prejudice. We have before us a "Treatise on the Affections of the Rectum," by Dr. James P. Tuttle, who is Professor of Rectal Surgery in the New York Polyclinic, and we confess that a careful and critical study of this work goes far to reconcile us to an arrangement by which the time and energies of a skilled and open-minded observer may be concentrated on a particular subject for many years, and with abundance of clinical and pathological material on which to work. For it becomes abundantly evident in the perusal of Dr. Tuttle's work that it embodies the results of an extensive, direct, and personal experience of the affections of the region dealt with, and that the writer has brought to bear on his subject a clear, unbiassed scientific intellect.

The introductory chapter opens with a brief but useful resumé of the development of the lower gut. This is followed by a fuller consideration of the anatomy of the region, and we note with satisfaction that emphasis is laid on the importance of distinguishing between the anus and the anal canal. On this subject, however, we miss any reference to Symington's work, although the observations of others are freely quoted. The modern anatomical description of the rectum as that portion of the gut which is devoid of peritoneum has been adopted, an arrangement which is calculated to simplify the consideration of rectal affections. The so-called first part of the rectum of the older anatomists is included with the sigmoid flexure under the term of pelvic colon.

The chapter on malformations of the anus and rectum is extremely good, and contains the most instructive series of illustrations of the various abnormalities we are acquainted with.

The examination of the rectum is very fully dealt with, and, as might be expected in the work of a specialist, many appliances are described and figured. Special stress is laid on the value of the proctoscope and sigmoidoscope as aids in diagnosis. The appearances of the rectal mucous membrane as seen through these instruments are depicted in a series of coloured plates.

Catarrhal affections, tuberculosis, venereal affections, and non-specific ulcerations are exhaustively dealt with, and brief abstracts of illustrative clinical cases are judiciously introduced.

The description of fissure of the anus occupies no less than twenty-seven pages. In it the author states, and we quote him with approbation, that "there is no place in rectal surgery for the palliative treatment of fissure." He does not favour treatment by merely stretching the sphincter, as in his experience the fissure often returns within a short period afterwards. He recommends incision through the ulcer, deep enough to put the sphincter at rest. The exhaustive chapters on abscess and fistula are among the most useful in the works, and long as they are they well repay perusal. The same remark applies to the section on stricture. Constipation and pruritus ani are considered in what is perhaps needless detail. The chapter on piles opens with a number of quotations from Holy Writ, which go to prove that the condition, under the name of "emerods," was known before Joseph was sold into bondage. "And he smote the men of the city, both small and great, and they had emerods in their secret parts." Many methods of treatment are described, mostly without comment, but we note with satisfaction that the method of ligature comes in for special commendation with italic emphasis, "whatever else may be said against the ligature operation . . . it is slightly if at all dangerous to life, and it absolutely cures the disease." Another method, which in this country is usually associated with the name of Mitchell, is described by the author as Earle's operation. It consists in removing the pile mass and suturing together the edges of the mucous membrane. We have repeatedly employed this method, and have found it eminently satisfactory. We would draw special attention to the valuable discussion on benign tumours of the rectum, particularly with reference to villous tumours and multiple adenomata, as these have hitherto received less attention than they seem to deserve. Cancer of the rectum is fully described, and the various operations for its relief considered. A chapter on foreign bodies in the rectum contains the usual startling statements with regard to the nature and size of objects which have been found in that cavity. One of these is new to us. A case is referred to "in which sixty snails were found in the patient's rectum." After some of the other statements of this kind we have read, we shall not be astonished to be told that this is so, but the possibility of the printer having inserted an extra 0 is in our mind.

The illustrations throughout the work are of a high standard, and have been wisely selected. Many of them are of exceptional teaching value. A comprehensive index adds greatly to the value of the work.

We congratulate the author on his work, which in our opinion is the most complete and instructive treatise on the subject in the English language.

ALEXANDER MILES.

Drinkers of Hemlock: A Novel. By A. Stodart Walker. Edinburgh: George A. Morton.

It is not usual for a medical journal to review works of fiction, but as the writer of the present novel is a member of the profession, though no longer in its active ranks, it may not seem out of place to draw the attention of Edinburgh men to the work of one of our *olim cives*. Dr. Stodart Walker has written much that has attracted the attention of literary and philosophical criticism, and which has carried his name far beyond the confines of these islands, but nothing he has written seems to us to make such a serious claim upon the attention of the public as "Drinkers of Hemlock." We do not hesitate to call it a great novel. First and foremost, it is the work of a psychologist and a man who has made an intimate study of human motive and action. The book is not without blemish: the chapter on Edinburgh, for instance, seems superfluous, and perhaps there is too much of politics for a work of fiction, and the characters may to the common mind seem too uniformly brilliant; but, having said as much, we hasten to add that no writer, excepting perhaps George Meredith, has portrayed so subtly the less palpable yet the more forcible motives which influence men and women in their relations to one another. A distinguished critic has said that in all he writes Mr. Stodart Walker has a calm and detached mind. Nowhere does Mr. Walker show his detachment so clearly as in "Drinkers of Hemlock." Its aloofness and disinterestedness are so striking at times as to seem almost cruel. Enough has been said in other places as to the brilliance of the dialogue. The epigrams are uniformly good. "Some people seem virtuous from conviction, most people to escape it." "To flirt is to be obliging without incurring obligation." "The world is governed by two classes, the deceivers and the entertainers." "Talk about the virtues of your friends and you will be counted a bore; be facetious about their vices and you will be voted a wit." But it is not upon the dialogue that the reputation of the novel will be built. It is upon its insight into character, its grace of style, and its sense of dramatic possibilities. Mr. Stodart Walker will no doubt do better work yet, but in the meantime we can only say that he has written a novel which is a credit to himself, to letters, and to the city which harbours him.

Kenneth Campbell.

The Natural and Artificial Methods of Feeding Infants and Young Children. By Edmund Cautley, M.D., F.R.C.P. Second edition. London: J. & A. Churchill. 1903.

The perusal of the second edition of this work fully confirms the favourable opinion which was expressed when the first edition was reviewed in these pages some six years ago. Owing to the great advance in our knowledge which has been made during recent years in all that pertains to the subject of infant feeding, the writer has had to make considerable modification in the views expressed by him in the earlier edition.

Dr. Cautley gives every credit to the American physicians for the pioneer work which they have accomplished in introducing percentage feeding, and thus emphasising the importance of regulating the proportion of the different constituents of the diet. After giving this method a prolonged trial, he has come to the conclusion that it is neither a necessary nor an advantageous system of feeding children, and he strongly recommends home modification in preference.

Though still believing that Pasteurisation of milk is necessary in the present state of our civilisation, the author has altered his opinion as to the effect this process has on the nutritive value of the milk, and believes that it is responsible for many cases of scurvy, besides being neither so nutritious nor so pleasant to the taste. He deplores the indifference of the responsible authorities to the character of the milk supplied to our large towns, and calls attention to the antiquated methods which still prevail with regard to the housing of the cows and the subsequent management of the milk. He draws a very striking picture, contrasting the methods of treating the milk adopted in Great Britain and in many parts of the Continent, which does not redound to the credit of this country. He considers that all necessity for sterilisation would be done away with if greater care were taken of the cows, and if the milking and after-management of the milk were carried out on scientific principles.

Considerable space is devoted to a consideration of the transmission of tuberculosis by infected milk, and while agreeing in the main with the views held and expressed by Koch, the author considers that the subject is still *sub judice.* We can cordially recommend this book as an excellent guide to the management of the artificial feeding of infants, the success of which so largely depends on careful and minute attention to detail. G. H. MELVILLE DUNLOP.

The Syphilitic Nature and Curability of General Paralysis and Tabes. By L. E. LEREDDE. Paris: C. Naud. 1903.

THIS interesting essay is devoted to an attack on the position of Professor Fournier with respect to the exact nature of the pathological processes on which general paralysis and tabes rest. Fournier considers them to be what he calls parasyphilitic, and in this view he has been followed by many writers, since he gave expression to this opinion in 1894. Dr. Leredde combats this strenuously, and seeks to show that they are purely syphilitic. The argument deduced from their incurability by recognised anti-syphilitic treatment, he shows to be not true in fact, and even if it were true, to be of little value, as cure, in the case of diseases of the nervous system, must mean only arrest of the diseased process, destroyed nervous tissue being incapable of complete replacement. Dr. Leredde sums up his conclusions in the following words:—"The affections which, at the present time, are designated by the name of tabes and general paralysis, are, in syphilitic persons, affections of a syphilitic nature and curable by mercurial treatment.

This truth has been unrecognised—

"1. Because mercurial treatment has not been carried out in these in a regular manner and by means of sufficient doses.

"2. Because, like all other lesions of the nervous system, the syphilitic lesions of tabes and general paralysis entail secondary lesions.

"3. Because histologists, who are able sometimes to affirm the syphilitic nature of a lesion by microscopical examination, believe they can state that certain lesions are not syphilitic when their nature is unknown.

"Tabes and general paralysis (in syphilitics) are not independent morbid entities, but are simply clinico-anatomical modalities, associated with a particular distribution, with a slow evolution of a syphilitic process. Between them and the typical forms of cerebral and spinal syphilis all intermediate varieties are found."

These propositions Dr. Leredde endeavours to establish in his essay. As regards treatment he advocates the hypodermic injection of benzoate of mercury in doses of 8 cgrms. daily. He records a number of cures by this means. With regard to these one would like to see a longer period elapse before the cure could be pronounced effective. As to the contention that the lesions of these diseases are of a syphilitic nature, we think the author has gone far to destroy Professor Fournier's recent position.

The essay can be thoroughly commended as a bright and interesting contribution to the discussion of the important subject of which it treats.

James Middlemass.

The Year-Book of Medicine and Surgery. Edited by G. M. Gould. Vol. "Surgery." London: W. B. Saunders & Co. 1903.

This year-book continues to maintain its high place among works of its class. The volume devoted to surgery contains nearly seven hundred pages of carefully made abstracts from the literature of the previous year. The papers selected for notice have been well chosen, and, as a rule, both sides of debatable subjects are impartially dealt with. We notice, however, here and there a tendency to report favourable results from new methods of treatment, without reference being made to unfavourable results which have also been reported. Thus, for example, we do not find any mention of the fact that in one well-known clinic at least, cocainisation of the spinal cord has been given up on account of the dangers attending the procedure. With regard to the injection of paraffin for the correction of deformities also we find no mention of the accidents which have been reported to follow. On the whole, however, the volume presents an admirable review of recent progress in surgery, and should prove of great use as a work of reference. A full and comprehensive index adds greatly to its value. There are over a hundred illustrations, chiefly of new instruments and appliances.

Alexander Miles.

Portfolio of Dermochromes. By Professor Jacobi of Freiburg im Breisgau. English Adaptation of Text by J. J. Pringle, M.B., F.R.C.P. London: Rebman, Ltd. 1903.

The second volume containing the two last parts of this extremely convenient Atlas has now appeared, and in no respect does it fall short of the previous one, while the selection of subjects from which the illustrations are drawn has been so happily made, that, with this to refer to, many problems difficult of solution, presented from time to time to the general practitioner, or even to the specialist, will be easily resolved. In reviewing such a work, made up in the main of disjointed details, one is perforce compelled to annotate on some of the representations which have specially struck one while turning over its leaves and mentally analysing the pictures. Thus the reproduction of folliculitis barbæ, or sycosis, shows how, in some of its forms, the destructive action of the morbid process thoroughly epilates the cheeks, leaving a smooth and white scar, though on the chin the follicular inflammation persists in full activity. This demonstrates the result which follows successful treatment by the X-rays; but in this respect the artificial is superior to the natural method of cure, inasmuch as that attained by the destructive suppuration is permanent, that procured by the X-rays is temporary; so that, in most cases, the hairs, after a time, grow as well as ever. On another sheet the gradual progress from ordinary rosacea to tuberous hypertrophy is admirably displayed under Acne rosacea and Rhynophyma. While the toxicodermiæ find a place, if perhaps a limited one, in most atlases, they seldom receive the attention their multiformity demands. Some of those depicted here are particularly prone to be misconstrued, such as that arising from the use of antipyrin, either when frankly taken as such, or less overtly as in migrainine; or that produced by arsenic on the palms; or, again, one not infrequently attributed to a more serious cause—that due to copaiba. All these find typical reproductions. The distinction between fibromata and sebaceous cysts is sharply differentiated in the two pictures set side by side. The characteristic features of Paget's disease and penetrating rodent ulcer find expression in plates, whose fidelity to nature is unmistakable. Quite a number of figures are devoted to the delineation of eczema, and no one, after studying these, ought to experience difficulty in recognising the rubrum type, or in distinguishing the seborrhœic dermatitis, to which Unna has so prominently directed attention. The fourth part is almost wholly devoted to syphilis, and not only are the more common, but also many of the rarer forms, of its cutaneous manifestations accurately portrayed. The letterpress, excellently translated from the German original by Dr. Pringle, necessarily brief when dealing with integumentary diseases, is much fuller in the specific portion, and will be found to provide a résumé of all that is essential.

W. ALLAN JAMIESON.

NOTES ON BOOKS.

WE welcome the first volume of the *Archives of the Middlesex Hospital* (Macmillan & Co., London, 1903), which appears under the direction of a small editorial committee, with Dr. J. Kingston Fowler as chairman. This issue contains eleven short articles of much practical and scientific interest. It is intended to issue not less than four volumes annually. We are sure that if the standard set by the first volume is maintained, all former students of Middlesex will desire to possess these *Archives.* They are printed on thick paper in bold, clear type, and are well illustrated.

In a small brochure Oppenheimer draws attention to some practical points in the diagnosis and treatment of *Gonorrhœa in the Male* (Rebman Ltd., London, 1903). The author apparently inclines to hold fast to the older methods of treatment, which, in the course of what appears to have been a fairly wide experience, he has found satisfactory. The so-called abortive methods of treatment, the use of irrigation in anterior urethritis as advocated by Janet, and the merits of the urethroscope, he holds in small esteem.

Miss Anne Ellison's *Manual for Students of Massage* (Baillière, Tindall, & Cox, London, 1904) appears in a second edition, revised by Gulielma Manley. The first half of the book is devoted to the description of the anatomy and physiology of the body, given in sufficient detail to meet the wants of the masseuse. The various manipulations are clearly described, and the indications for each pointed out. A series of simple diagrams is introduced, and will materially aid the student. The young masseuse should pay particular attention to the useful list of Don'ts to be found on p. 95. We are not familiar with the verb "to mass," which the author repeatedly employs.

A useful little work on *First Aid in Accidents* (George Gill & Sons Ltd., London) has been written by Collie and Wightman. It is specially adapted for those who use the London School Board Syllabus. A useful feature is the series of questions, with appropriate answers, appended to each chapter. A chapter on Stretcher Drill is included.

Practical Nursing, by Isla Stewart, Matron of St. Bartholomew's Hospital, and H. E. Cuff, M.D., F.R.C.S. (William Blackwood & Sons, Edinburgh and London, 1903), is a useful guide to nurses entering on their studies. It is clearly written, accurate, and well up to date.

Dr. Jex Blake has done well to reissue her small book on *The Care of Infants* (George A. Morton, Edinburgh). This manual for mothers and nurses is full of wise advice, the result of the author's long experience, and should be in the hands of all to whom the care of infants is entrusted.

The *Home Nurse*, by S. F. A. Caulfield (Elliot Stock, London, 1903), is the work of an amateur, and is doubtless written with the best intentions. The chapters reprinted from the *Girls' Own Paper*, and the poem entitled "The Star of India," can do no harm to any one, but we cannot say the same of the rest of the book. It contains too many gratuitous advertisements of quack medicines to be placed with safety in the hands of lay readers.

The new (eighth) edition of Mr. Ince's *Latin Grammar of Pharmacy* (Baillière, Tindall, & Cox, London, 1903) has been rearranged and considerably enlarged. Its value to students of pharmacy is still further enhanced by the addition of an English-Latin vocabulary.

The fact that Dorland's *Pocket Medical Dictionary* (W. B. Saunders & Co., London and New York, 1903) has gone through four editions in as many years sufficiently attests its value. We have subjected it to several crucial tests, and have rarely found it wanting. Among other useful features may be mentioned a series of tables of doses, weights and measures, temperature scales, arteries, nerves, and muscles, which are extremely convenient for hurried reference.

Students, house-surgeons, and others will find Dr. Melland's *Pocket-book of Clinical Methods* (John Wright & Co., Bristol, 1903) a handy and reliable guide to the examination of sputum, urine, pus, blood, etc., for clinical purposes.

The *Examination of the Urine*, by Dr. J. K. Watson (The Scientific Press Ltd., London), is addressed to nurses, and contains a very useful description of the naked-eye appearances of the urine in health and disease, which every nurse will do well to study. If it is considered advisable that the chemical analysis of the urine should be entrusted to the nurse, she will find in this little work a helpful and reliable guide.

RECENT ADVANCES IN MEDICAL SCIENCE.

◆

MEDICINE.

UNDER THE CHARGE OF

A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,

MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

THE DWARF TAPEWORM (*Hymenolepis nana*).

STILES (*N. Y. Med. Journ.*, November 7, 1903) gives a very interesting account of a dwarf tapeworm recently discovered in America as a parasite of man. The four large tapeworms, viz. *Tænia solium*, *T. saginata*, *T. confusa*, and *Dibothriocephalus latus*, are well known to all American physicians. There appears, however, to be another and much smaller tapeworm, a mere Tom Thumb compared with the others; only measuring from one-fifth to slightly less than 2 in. in length. Like *Tænia* it has four suckers on the head and the genital pores are lateral, but all the latter are set on the left margin. Like *T. solium*, the head has a crown of hooks which in *T. solium* is double, in *Hymenolepis nana* single, and the hooks are of a characteristic form, different from those of *T. solium*. Characteristic for the genus *Hymenolepis* is the presence of three testicles in each segment; *T. saginata* possesses about 1200 testicles. The dwarf tapeworm was first described in France by Dujardin in 1845, as a parasite in the brown rat. Bilharz in 1851 found a similar parasite in man in Egypt. Since the early observations by Dujardin and Bilharz it has been shown that *Hymenolepis nana* occurs either in man or in rodents, or in both, not only in Egypt and France, but also in England, Italy, Sicily, Russia, Germany, Servia, Austria, Denmark, Siam, Japan, Brazil, Argentine, and the United States. About one hundred cases in man have been thus far recorded, most of the patients being males and the large majority of these children. Sixty-five of these cases were in Sicily, where Calandruccio estimates that 10 per cent. of the children are infected.

The first case reported in the United States was published by Spooner in 1873; the second case was not recognised until the summer of 1902, by Moore in Texas. Since then Stiles has met with more than a dozen cases distributed all through the States. Since 1902 his division of the United States Hygienic Laboratory examined nearly 3500 patients for intestinal parasites, and the dwarf tapeworm was found sixteen times, *T. saginata* only twice, *T. solium* not once.

It appears that rats and mice are the regular hosts for this worm; that as rats and mice have a habit of visiting pantries and other places in which food is kept, the eggs of the tapeworm may be thus easily communicated to man. The dwarf tapeworm inhabits the ileum, and there may be a single parasite or several thousand specimens present in one patient. Simultaneous infection with other parasites is common, and as many as four other species have been found occurring with *Hymenolepis nana.* Infection may persist from two months to two years and a half, perhaps to five years, or until terminated by successful treatment. The local pathological changes caused by this parasite seem to be slight, but very possibly the elimination of a toxine, absorbed by the host, plays an important rôle in causing the symptoms.

Stiles summarises the symptoms caused by the dwarf tapeworm in the words of Ransom. "The effects of helminthiasis with *Hymenolepis nana* are no more severe than they occur from infection with other tapeworms, nor, if it is considered that many cases of the former are probably overlooked, are serious symptoms more common. Although the effects are usually so slight, even though the parasite be present in considerable numbers, that the symptoms are only very mild or absent entirely, it occasionally happens, as with the larger tapeworm, that severe symptoms (persistent diarrhœa, epileptiform attacks, etc.) are exhibited. The most frequent symptoms determined by the presence of *Hymenolepis nana* are abdominal pains, which may or may not be associated with diarrhœa; convulsions of various sorts, frequently epileptiform, headache, and strabismus. Nasal or anal pruritus, common in cases of infection with other tapeworms, is rarely seen with *Hymenolepis nana.* In many cases in which a neuropathic condition is already present, infection with *Hymenolepis nana* is likely to result in an aggravation of the morbose phenomena, and in general a predisposition to nervous disease seems to be the important factor in the appearance of nervous symptoms."

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

LECTURER ON SURGERY, SCHOOL OF MEDICINE, EDINBURGH.

The Surgical Problem in Prostatic Hypertrophy.

Hawley believes that the rôle of the hypertrophied prostate, as a pathological condition, is purely a mechanical one, and discusses the manner in which it acts. His conclusion is that the clinical manifestations of enlarged prostate are due to the displacement of the urethra and bladder, produced by the increase in size of the gland. The displacement of the base of the bladder is chiefly in an upward direction, because the lateral and posterior portions of the gland chiefly undergo hypertrophy. Under these conditions the interference with urinary evacuation is due to elevation of the outlet of the urinary reservoir, and to incomplete emptying of the bladder through limitation of the vesical movements.

From an elaborate consideration of these propositions the author has devised a method of treatment, which, unfortunately, he has so far only carried out on the cadaver. Through a transverse perineal incision he exposes the bulb of the urethra and the posterior half of the urethra. The recto-urethral muscle and the levatores ani are divided, the prostatic sheath opened along the under-surface of the prostate from base to apex, and the sheath separated with the finger from the lateral and under-surface of the retro-urethral prostate. The prostate is then dislocated downwards. In this way the level of the neck of the bladder was definitely lowered. The depression was increased when sections of the lateral lobes had been removed. The urethra, bladder, and ejaculatory ducts were uninjured. "The operation is directly opposed to prostatectomy, in that it attacks the inferior supporting structures, avoiding attack on the protruding prostatic mass above."

The author claims that this method of treatment is appropriate to early cases of prostatic hypertrophy, before the urinary tract has become infected and disorganised, because it can be carried out as an aseptic operation, because the urinary organs are uninjured, and because the operative risk is seemingly small.—*Ann. Surg.*, Phila., November, 1903.

TRAUMATIC JACKSONIAN EPILEPSY.

PAUL DELBET, in reporting to the French Surgical Congress a successful case of operation for Jacksonian epilepsy, states the conclusions to which he is led by an analysis of 300 cases of this affection—(1) Trephining should be employed as early as possible in all cases in which the traumatic nature of the condition is established, care being taken, however, to exclude the possibility of syphilis and of hystero-epilepsy. (2) The operation is indicated even in cases of long-standing and of exceptional severity. (3) If there is a marked depression or sinking in of the skull, the trephine should be applied over this part to admit of the removal of the depressed or thickened portion of bone. Incision of the dura mater is not indispensable, but is advisable in order that the condition of the brain may be investigated. (4) When there is no depression a large osteo-plastic flap should be raised, in order that an extensive area of membrane and brain may be exposed. This is essential, in view of the uncertainty of the localisation of the primary focus of irritation. It also enables the bone to be replaced, and so tends to obviate those secondary epileptic symptoms which frequently ensue when a large gap is left permanently in the skull. (5) Patches of meningo-encephalitis should be excised, and the brain, if it appears normal, should not be touched. (6) The brain is only to be explored if no cause for the attacks is found in the skull or membrane. (7) The operation is successful in the majority of cases in which a superficial lesion or an inflammatory cerebral lesion is found; it is usually unsuccessful in degenerative lesions of the brain. (8) If a first operation prove unsuccessful, results show that it is often justifiable to perform a second, or even a third.—*Rev. de chir.*, Paris, November, 1903.

OÖPHORECTOMY IN IRREMOVABLE CANCER OF THE BREAST.

REYNÈS reports a case of a woman, æt. 32, who suffered from double cancer of the breast, with extensive infection of the axillary glands, in whom this operation was performed. The left breast was ulcerated, and excision of the disease was considered impracticable. On 20th May 1903 the ovaries were removed. A month later a diminution in the size of the tumours was manifest; two months later the ulcer had cicatrised; and at the date of report—five months after operation—the tumours had entirely disappeared, and the general health of the patient was excellent. The cancerous nature of the tumour was established microscopically by Professor Cornil.—*Rev. de chir.*, Paris, November, 1903.

RECURRENT DISLOCATION OF THE ULNAR NERVE.

COBB reports a case of this condition, resulting from injury, which was cured by operation. The patient was a lumberman, æt. 52, who struck the inner side of his elbow against a post while trying to save himself from falling. The elbow was swollen and tender, and motion of the forearm caused pain. He had no painful or tingling sensations in the hand till about two months after the injury. The area of distribution of the ulnar nerve became numb, and he observed that flexion of the forearm caused these pains, and that a "round cord" slipped backward and forward over the inner side of the elbow, and that these movements were attended with sudden darting pains. On examination, the bones about the elbow were found to be normal, but the ulnar nerve appeared to be about twice as large as that on the healthy side. In extension of the elbow it lay behind the internal condyle, while on flexing the joint it could be felt to roll over the tip of the condyle, and on complete flexion it came to lie in front of the condyle. The nerve could be kept in position during flexion by pressure with the fingers, but the pressure caused pain along the distribution of the nerve. There was no loss of sensation in the area supplied by the nerve; the strength of the hand was good, and there was no apparent muscular atrophy.

On exposing the nerve it was found to be very superficial, and to present a fusiform thickening behind the elbow. The groove behind the condyle was filled up by muscle fibres, apparently a portion of the triceps. The arcuate ligament could not be identified. The groove was cleared, the nerve replaced, and a portion of the fascia of the triceps stitched over it. Four weeks after the operation the patient could use the arm freely without the nerve again becoming displaced. It is now two and a half years since the operation, and the patient remains well.

Abnormal mobility of the ulnar nerve, apart from injury, is comparatively common, but the symptoms are seldom sufficiently severe to call for operation.

The author has summarised all the reported traumatic cases he can find which were submitted to operation—fifteen in number, and the results show that the operation is, as a rule, successful.—*Ann. Surg.*, Phila., November, 1903.

A NEW OPERATION OF VARICOCELE.

PHOCAS has operated on twelve cases of varicocele on a new plan. He divides the scrotal ligament, after having dislocated the testicle, and then fixes the organ higher in the scrotum. He does not in any way interfere with the veins. He believes that in varicocele the scrotal ligament is too short, and that after raising the testis the veins improve. He attributes the good results which follow on resection of portion of the scrotum to the incidental division of this ligament.—*Rev. de chir.*, Paris, November, 1903.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
F. W. N. HAULTAIN, M.D., F.R.C.P.Ed.,
PHYSICIAN FOR DISEASES OF WOMEN, DEACONESS HOSPITAL, EDINBURGH;
AND
J. A. C. KYNOCH, M.B., F.R.C.P.Ed.,
PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, ST. ANDREWS UNIVERSITY.

EXCISION OF THE THYROID DURING PREGNANCY.

VON FELLENBERG (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 42), after referring to the occurrence of dyspnœa during pregnancy as the result of tracheal compression by enlargement of the thyroid, reports two interesting cases where excision of the gland was urgently necessitated—(1) Patient, æt. 32, was admitted to hospital on account of dyspnœa associated with great enlargement of the left lobe of the thyroid. She was eight months pregnant. A sudden choking attack with cyanosis demanded immediate tracheotomy. This, however, was found impossible on account of the enormous size of the thyroid, which extended down into the thorax. Kocher's incision towards the left side enabled Fellenberg to enucleate the incarcerated left lobe; the right lobe, being only slightly enlarged, was not removed. Convalescence was satisfactory, and the patient was normally confined a month later. (2) Patient, æt. 24, 1-para, admitted with general enlargement of the thyroid, compressing trachea, and causing recurrent attacks of severe dyspnœa. Both lobes were removed, Kocher's incision being used. Recovery satisfactory, normal confinement two days later. Fellenberg considers that removal of the gland was fully justified in those cases on account of the difficulty and possible insufficiency of tracheotomy. To prevent the tendency to tetanic attacks, Fellenberg put the second patient on thyroid treatment, and recommends this as necessary where the whole gland is removed. He refers to a case published by Dienst, where tetany occurred after complete removal of the gland, and where it had not subsequently been given as a remedy. Meinert also reported a case of tetany coming on after partial removal of the gland, the remaining lobe having become atrophied.

VAGINAL OPERATIONS WITHOUT NARCOSIS.

FROMMER (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 45) refers to three cases of vaginal hysterectomy operated on by Gradenovitz (*Monatschr. f.*

Geburtsh. u. Gynäk., Berlin, Bd. xvii. S. 45) after hypodermic injection of morphine. The only painful process was the ligaturing of the lower part of the broad ligaments and tubes. Fellenberg recommends the avoidance of general anæsthesia in vaginal operations where the patients are old and suffering from organic disease of some important organ. He reports three successful cases—(1) Patient, æt. 69, anterior and posterior colporrhaphy with amputation of the cervix; duration of operation, one hour. (2) Patient, æt. 34, mitral stenosis, with bronchitis; admitted to hospital for irregular uterine hæmorrhages and prolapse; curetted, both cervical lips amputated, and posterior colporrhaphy. (3) Patient, æt. 77, senile heart; admitted for carcinoma of fundus uteri, with myoma of the posterior uterine wall. Uterus extirpated, clamps followed by ligature of the broad ligaments being used; duration one hour. In all these cases the patients complained of very little discomfort during the operations. Fellenberg thinks it unnecessary to first inject Schleich's solution into the broad ligaments and tubes, but has found this useful when injected into the perineum and vulval region prior to operation. He always gives a hypodermic of morphine half an hour before operating. As perforation of the uterine wall by the curette nearly always happens when the patient is under the influence of an anæsthetic, Fellenberg thinks general anæsthesia should be avoided when curetting the uterus.

FUNDAL SUSPENSORY LIGAMENT AFTER VENTRO-FIXATION.

MICHEL (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 39) points out that as the result of stretching of adhesions between the fundus and abdominal wall after ventrofixation, difficulties in subsequent labours are less likely to occur, as contrasted with those following vaginal fixation. He reports the following case to show that extreme stretching of fundal adhesions may occur without pregnancy. Patient, æt. 49, had large dermoid cyst of ovary removed, and a movable retroflected uterus treated by ventrofixation (Fritsch's method). Three years later, patient complained of constant abdominal pain associated with a slight ventral hernia. The abdomen was re-opened by a transverse suprapubic incision. The adhesion between the fundus and abdominal wall had become so stretched as to form a ligament 15 cm. long. Microscopic examination showed it to be composed chiefly of vascular connective-tissue. Michel believes that as the result of gradual stretching of the adhesion, the fundus had become so far removed from the anterior abdominal wall as to permit of intra-abdominal pressure forcing the uterus downwards and backwards with consequent formation of the unusually long suspensory ligament.

OVARIAN PREGNANCY.

MICHOLITSCH (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 42) reports two cases of ovarian pregnancy occurring in a series of 120 operations for ectopic pregnancy—(1) Patient, æt. 32, had one previous normal labour. The present specimen was obtained by anterior colpotomy.

The swelling was about the size of a small apple and quite distinct from a normal Fallopian tube. Microscopic examination showed villi and amnion in the capsule of ovarian tissue. Inside the capsule there was found a blood-mole containing an empty sac the size of a hazel-nut. (2) Patient, æt. 23, 1-para, had a left-sided ovarian tumour removed by colpotomy. The corresponding tube was normal. Section of the cyst showed it to be a blood-mole containing an empty amniotic cavity. The capsule was composed of a thin layer of ovarian tissue. Micholitsch offers no theory to explain how the ovum became embedded in ovarian tissue.

The Bacteriology of the Puerperal Uterus.

Marx (*Am. Journ. Obst.*, N. Y., September, 1903) publishes a report on an investigation into the bacteriology of the puerperal uterus. Elaborate aseptic precautions were adopted, and care taken to prevent contamination from vulva, vagina, or cervix. Cultures were taken of the lochia in fifteen consecutive cases, at first from six to twelve hours after labour, and then on every alternate day. The cultures in fourteen cases proved negative, in the fifteenth acute sepsis developed. The investigation proves that the puerperal uterus is sterile, and if pathological organisms are present they have been introduced by accidental contamination.

Bossi's Reply to Duhrssen's Criticism of his Dilator.

Bossi (*Arch. de obst. y. ginec.*, Madrid, May, 1903) writes as follows:—"Duhrssen says that, while knowing my methods of artificial induction of labour since 1890, he has not personally put them into practice, because he has found that mechanical dilatation of the neck of the uterus does not give good results in gynecological work. There is a difference between dilating a pregnant and a non-pregnant uterus, but even as regards the non-pregnant uterus, during the past seventeen years I have always been able, with Hegar's dilators, to obtain in a few minutes a dilatation of the cervix sufficient for any operation and without any troubles.

"Duhrssen's criticism is practically based on assertions without proof, for he has not even tried my methods. He asserts that the method is not certain, because it is not sure in every case to obtain sufficient dilatation for the extraction of a living child. On the other hand, my experience and that of my assistants for the past twelve years, and of the world at large more recently, stands to prove that sufficient dilatation to save both mother and child can be obtained in comparatively a few minutes. He says the method is not prudent, because the lacerations are not controllable; but as a matter of fact, if the index and middle fingers be kept on the cervix, dilatation is continuously and perfectly supervised and guarded, and lacerations may be entirely avoided. Characterising it as not innocuous because it causes lacerations, hæmorrhage, and infection, he advocates incision of the cervix, as if that did not cause hæmorrhage. I have tried incisions instead of dilatation in some cases, so that I do not make unsupported assertions, and have proved the great dangers of this method, dangers arising from hæmorrhage, from laceration of the uterus on extraction of the child. My experience has convinced me that to advise incisions in private practice where the accoucheur is so often alone, is worse than imprudent, it is most dangerous, since it exposes the unfortunate surgeon to lose mother, child, and his reputation. My method fulfils the necessary conditions of (1) dilating with certainty and sufficiency the cervix in any stage of pregnancy and in any condition ; even in primiparæ the cervix may be dilated promptly and accurately ; (2) it permits the dilatation to be quick or slow, from ten minutes upwards according to the urgency of the case ; it affords at the same time both a mechanical and dynamic action, and both under the control of the operator. My dilator can be used by any practitioner, it entails no subsequent sutures, and by ensuring the emptying of the uterus renders the obstetrician master of the situation. Incision and vaginal Cæsarean section will almost cease to be done, and even abdominal Cæsarean section will lose some of its indications."

THERAPEUTICS.

UNDER THE CHARGE OF

RALPH STOCKMAN, M.D., F.R.C.P.Ed.,

PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY;

AND

FRANCIS J. CHARTERIS, M.B.,

ASSISTANT TO THE PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY.

EFFECTS OF SUPRARENAL CAPSULE ON BLOOD VESSELS.

THESE authors have already shown that after intravenous injection of adrenalin the vaso-constriction in a rabbit's ear (on the non-operated side) is usually followed by a vaso-dilatation exceeding that which existed before the injection. They now communicate the results obtained by subcutaneous injections. Frequently the primary result is vaso-dilatation. If, however, a large distinctly poisonous dose be injected, there is blanching of the ears ; a medium dose causes a moderate but distinct dilatation of the blood vessels. In rabbits in which the vasomotor nerves were cut on one side, subcutaneous injection of a medium dose of adrenalin induced a distinct constriction of the vessels on the operated side, and a dilatation on the unoperated side. These experiments show that even after subcutaneous injection, adrenalin has a very effective action on the blood vessels. The action is both local and central. The local action is constrictive, but the central action with small and medium doses is chiefly on the vaso-dilating mechanism, and hence the local constriction is over compensated or neutralised. After eliminating the central effect, only the local constricting action is obtained. With very large poisonous doses the central constrictor mechanism is stimulated, and hence there is distinct constriction of the vessels. It has frequently been stated that adrenalin is rapidly oxidised in the tissues into an inert substance. The authors have been able to disprove this. They injected the drug into tightly ligatured legs, and allowed it to remain in contact with the tissues for several hours. On removing the ligature, the systemic effect of the drug was obtained unimpaired, and consequently they conclude that adrenalin is but little oxidised in the tissues.

The ideal hæmostatic would lower pressure throughout the normal parts, and at the same time directly constrict the bleeding vessels. It is quite possible that adrenalin may have this effect in pathological conditions, since it is reasonable to assume that, in a hæmorrhage from a diseased part, the vasomotor innervation of these parts is essentially injured.—S. J. Meltzer and Clara Meltzer, *Am. Journ. Physiol.*, Boston, July, 1903.

MEDICAL TREATMENT OF TUBERCULOUS PERITONITIS.

THE results of medical treatment are not inferior to those obtained with operative measures, while the patient is spared the immediate risk of the operation and the possibility of post-operative trouble from ventral hernia or fistula. Of eleven cases medically treated by Thomayer in 1902–1903, total disappearance of fluid and fever was obtained in seven cases.

To ensure good results the cases must be carefully selected. Prognosis is not favourable where there are advanced lesions of the lungs or copious pleural effusion. A case of peritonitis with effusion is more hopeful than the dry form. Tuberculous peritonitis is such a chronic disease that it is rare for urgent indications to appear necessitating immediate evacuation of the fluid, and in such cases relief can be given by simple puncture. Similarly, in cases where the effusion remains stationary for a long time, or where the acme of the disease has already been passed, puncture can be carried out without risk of the fluid re-accumulating.

The medical treatment recommended is the use of an iodoform soap (iodoform, 1 grm.; soft soap, 20·00 grms). This is rubbed in once a day over the abdomen; and afterwards a moist compress, covered with impervious tissue, is applied. The inunction is repeated daily till the skin becomes irritated and red, when a cold compress is applied for one to two hours daily. If the irritation persists, the inunction is stopped, and the parts are dusted with starch. Good food and tonics are combined with the local treatment, and after disappearance of the fluid, the patient should be sent to the country for a prolonged period. Increase in body weight is the best proof of general amelioration.—Zhoto, *Arch. Bohèm. d. méd. Clin.*, Prague, 1903, fasc. 1.

INFLUENCE OF CHINIC ACID ON THE ELIMINATION OF URIC ACID.

WEISS, BLUMENTHAL, and other observers have claimed that chinic acid has a distinct therapeutic effect on the elimination of uric acid in the urine. Some doubt was thrown on these claims by the results of

Hupper's experiments on himself. At the annual meeting of the American Physiological Society held at Washington in May 1903, Taltavall and Gies communicated the results of some experiments on a dog kept in a state of approximate nitrogenous equilibrium. The diet was a mixed one, consisting of hashed meat, cracker meal, lard, bone ash, and water. Chinic acid was given for ten days, in amounts varying from 1 to 20 grs., but the effect on the uric acid output was not marked. The amount of uric acid was only slightly diminished.—*Am. Journ. Physiol.*, Boston, July, 1903.

TAPPING THE PERICARDIUM.

AT a recent meeting of the Vienna Medical Society, Lotheissen reported a case of successful puncture of the pericardium. Following an attack of rheumatic fever, there was mitral stenosis and incompetence, and the aortic valve was also incompetent. There was marked pericarditis with great increase of the cardiac dulness. The pulse was over 100; there was marked cyanosis and great ascites with œdema of the legs and lumbar regions. Internal medication proved of no avail, so the pericardial sac was tapped. Under Schleich's anæsthesia a small incision was made through the skin at the level of the fifth intercostal space, about three-finger breadth to the left of the left edge of the sternum. A trial puncture was made, and then a thin trocar was introduced into the pericardium. About 200 c.c. of a fluid mixed with blood was drawn off. There was collapse requiring injections of camphor. After the operation the dulness was much reduced. Under agurin, diuresis was established, and the œdema rapidly disappeared. Three months after the operation the cardiac dulness was only slightly increased towards the right, but otherwise was within normal limits. The mortality after paracentesis pericardii is very high, amounting to about 60 per cent.—*München. med. Wchnschr.*, 1903, No. 45.

QUININE HYDROCHLORIDE IN MÉNIÈRE'S DISEASE.

BRADLEY has obtained very satisfactory results in Ménière's disease by using quinine on the following plan:—The dose is gradually increased till the patient begins to complain of an increase in tinnitus. This is taken as the maximum dose, and one which will control the paroxysms of vertigo. To avoid the bad effects of quinine on the hearing, it is desirable to keep below the point where an increase of tinnitus is caused. Thus if 10 grs. cause tinnitus, and 9 grs. do not, then 9 grs. may be taken as the maximum amount to be given at one dose. The dose may then be regulated into three increasing portions. In one case, 7 grs. were given morning and noon, and 10½ grs. at night. It was found that 24 grs. given in this fashion completely controlled the paroxysms. After a month's freedom the dose was reduced, and it was found that 18 grs. in the day were sufficient, and after a further ten days this amount was reduced to 15 grs. Subsequently, it was possible to restrict this still further, and it was found that 12 grs. prevented paroxysms. Two grs. were given in the morning, 4 grs. at noon, and 6 grs. at night. This dose will require to be permanent, and must be kept up for an indefinite period. The paroxysms were reduced from two each day to one in three months, and the patient was able to resume his work.—*Therap. Gaz.*, Phila., October, 1903.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

R. F. C. LEITH, M.B., F.R.C.P.Ed.,

PROFESSOR OF PATHOLOGY, THE UNIVERSITY, BIRMINGHAM.

THE ORIGIN AND NATURE OF ALEXINES.

TURRO (*Journ. de physiol. et de path. gén.*, Paris, September, 1903) gives the results of a series of observations made during the last four years, upon the alexines derived from the thyroid gland and other sources. They are much as follows:—(1) Alexines are substances which convert bacterial protoplasm into a granular or soluble substance, hence they are called bacteriolysins. (2) Alexines are produced by plasma cells, and those produced by phagocytes and macrophages are called cytases. (3) The properties of alexines differ according to the cells which produce them, some being active, others inactive on certain kinds of bacteria. (4) The alexines which he experimented with were obtained from the thyroid gland, the suprarenal capsules, the cortical epithelium of the kidney, the lymphatic ganglia, the muscular splenic and hepatic tissues, and also those of the yolk of the egg of the fowl rendered soluble in the white. (5) Chemically, the alexines are enzymes, which digest the bacteria by a progressive hydrolysis. (6) The cells are capable of elaborating and liberating into the fluids of the body, an inexhaustible quantity of these alexines; from a portion of the spleen, for example, it is possible to obtain enzymes (bacteriolytic) capable of digesting twenty or thirty times their weight of *Bacillus anthracis*, but these enzymes may by certain means be made and remain inactive, if they do not become soluble and diffused through the fluids. He thinks that the process by which the cell elaborates these alexines, and then liberates them, is intimately connected with the problem of natural immunity.

THE TYPHOID BACILLUS IN THE LUNGS OF TYPHOID FEVER CASES.

THERE is still some doubt as to the relation of respiratory lesions (bronchitis, pneumonia, etc.), in cases of typhoid fever, to the causal bacillus of the primary disease; and Bancel (*Journ. de physiol. et de path. gén.*, Paris, September, 1903) gives the result of a number of observations he has made in cases where the lung mischief was of a very varying character, such as bronchitis, congestion, pneumonia, broncho-pneumonia. His method was to puncture the lung, by means of a sterilised hypodermic needle, and withdraw a few drops (never more than 1 c.c.) of blood or serous fluid, which was then added to nutrient bouillon. He took great care in identifying the bacillus obtained. He never found the slightest trouble following upon his puncture, and thinks it is much easier to obtain the bacillus in this way, in all cases in which there are any respiratory symptoms, than by a bacteriological examination of the blood. He suggests that it might in such cases be adopted as an alternative means of diagnosis, particularly when Widal's reaction is negative, and believes that it will be easily obtained in the great majority of such cases. He also thinks that it affords useful prognostic information, as it is indicative of a serious, if not of a very grave case.

THE AGGLUTINATION REACTION IN OSTEOMYELITIS.

GIANI (*Gior. d. r. Accad. di med. di Torino*, 1903, tome lxvi.) found that the blood of a patient, suffering from osteomyelitis, strongly agglutinated a pure culture of *Staphylococcus aureus*, even in a dilution of 1 in 100; and suggests that the agglutination reaction may come to be a valuable diagnostic sign between osteomyelitis and rapidly growing bone tumours.

ON THE SYMBIOSIS OF THE INFLUENZA BACILLUS.

M. NEISSER (*Prag. med. Wchnschr.*, June 25, 1903, Bd. xxix. S. 463) quotes Cattani's results in growing successfully the bacillus of influenza, along with other bacilli both living and dead, and also Grassberger's and Meunier's who obtained giant colonies of the influenza bacillus, when conjoined with staphylococci. He himself cultivated the bacillus for a long time on agar along with the xerosis bacillus. The reason of this symbiosis is obscure. It is not known whether it is the mere bodily presence of the xerosis bacillus or its secretions which facilitate the growth and prolong the life of the influenza bacillus in artificial cultures. It is interesting to note that the diphtheria bacillus itself also favours the growth of the influenza bacillus.

HÆMOLYSINS AND BACTERIOLYSINS.

GREAT activity is being everywhere shown by workers in this difficult field of biochemical research. Ritchie (*Journ. Hyg.*, Cambridge, 1902) and Muir (*Lancet*, London, August 15, 1903) have lately contributed valuable papers bearing on this subject, which would be noticed here, were they not already easily available. Welch's Huxley Lecture, *Lancet*, London, October 11, 1902, and Grünbaum's Goulstonian Lectures, *Lancet*, London, March 21, 1903, are not referred to here for the same reason, but still more recently Abbot and Gildersleeve and Thompson have given (*Journ. Med. Research*, Boston, August, 1903) the results of some interesting experiments in a few of its aspects. The two former workers treat of the proteolytic enzymes and of the so-called hæmolysins of some of the common saprophytic bacteria, namely, the *B. fluorescens*, the *B. pyocyaneus*, the *B. subtilis*, the *B.*

prodigiosus, the *B. proteus* (*vulgaris*). The interpretation of their reuslts is not easy, and they suggest that the following deductions may be made. The destiny of non-toxic, though otherwise physiologically characteristic products of bacterial life in the body, is determined by the presence of specific neutralising substances capable of demonstration in the circulating blood. (2) The customary methods of artificial immunisation may slightly increase the amount of such antidotal substances in the blood. (3) The proteolytic enzymes resulting from the growth of different bacterial species may be distinguished from one another, as well as from certain physiologically analogous enzymes of animal origin, by the use of sera from animals, immunised from the non-toxic bacterial products, poor though such sera are in specific immune body. (4) The proteolytic enzymes of some bacteria may be heated to 100° C. from fifteen to thirty minutes, without entirely losing their hæmolytic action. (5) The hæmolysins of some bacteria are probably of the nature of proteolytic enzymes. Thompson has studied the bacteriolytic complement content of the blood serum in normal vaccinated and variolated rabbits, and in variola in man. In the rabbit, he finds that the bacteriolytic complement content of normal blood serum is closely allied to the bacteriolytic complement content of normal human blood serum for the typhoid and colon bacillus. Normal rabbits show some individual variation in complement content for the typhoid bacillus, and more marked fluctuation for the colon bacillus. Vaccination and variolation do not affect the bacteriolytic complement content of rabbits' serum for the typhoid and colon bacillus, but it is much diminished in the last stages of certain fatal diseases. In the human subject his first difficulty was to get enough blood, as it seemed hardly justifiable to open, several times or even once, one of the larger veins. A series of experiments were first undertaken to determine whether or not sera of other animals, when deprived of complement, could be substituted for heated human serum in supplying an amboceptor for human complement. Their results showed that the amboceptors of at least three different blood sera, namely, those of the monkey, of the rabbit, and of the horse, will combine with the complement of human sera, giving bacteriolysis for the typhoid bacillus in identically the same manner as when heated and unheated serum of the same person is used for the test. A single puncture of the ear of the patient gives, therefore, all the blood necessary. This may be simplified by likening the *cell or bacterium* to a lock, the *amboceptor* to a key, and the *complement* to the hand that turns the key. Bordet has shown that the heated serum (amboceptor) could be reactivated so as to produce hæmolysis by the addition of complement from various sources. In other words, almost any hand can turn the key; but Thompson has found that several different keys may fit the same lock. In the case of the human, and some animals, the similarity is so near that the lock may be turned by either key, provided there is strength enough in the hand (complement) to manipulate the key. The amount of complement content is, therefore, of much importance. He was able to corroborate certain findings of others in showing that—(1) Most normal individuals have a high complement content, $\frac{1}{20}$ c.c. of their blood serum added to 1 c.c. of heated serum being sufficient to destroy large numbers of typhoid bacilli in a few hours. (2) This complement content is remarkably fluctuating; conditions of lowered vitality, due either to fatigue or infection, may temporarily cause a diminution which may, under proper conditions, be promptly restored. (3) Certain individuals show, on repeated examination, a low complement content, the cause of which may not be evident. He next studied what relation the changes observed in the course of an acute infectious disease (smallpox) may bear to the factors involved in the causation and course of this disease. He found a diminution of complement content in the early stage of the disease, and a rapid return of the complement content to normal in the cases unattended with secondary infection, but a failure in those so attended, indeed there was a progressive continued diminution in the complement content when the case is complicated by terminal septicæmia. Variola may thus be regarded as a clinical entity involving two processes. (1) Infection by a definite specific contagion; (2) a secondary local or general pyogenic process which may or may not be present, and may be of serious import. The first causes a diminution of the complement content of the blood, and if severe, the patient enters the pustular stage of variola before this complement has become again restored to normal, and this permits of the establishment of a general pyogenic infection.

THE NON-IDENTITY OF AGGLUTININS ACTING UPON THE FLAGELLA AND UPON THE BODY OF BACTERIA.

THE subject of the agglutinins is of practical as well as of scientific importance, owing to the extensive use of the clumping reaction in diagnosis. Malvoz and Dineur both concluded that the Widal reaction in typhoid fever depends upon the typhoid affecting the flagella of the bacilli. Ernst and Robey, on the other hand, concluded that "the agglutinating property does not lie in, and is in no way connected with, the flagella of the bacteria concerned." We further know that bacteria not possessed of cilia are clumped in immune sera, but that solutions of the sera much more concentrated than in the case of motile bacteria must be used.

Theobald Smith and Arthur Reagh (*Journ. Med. Research*, Boston, August, 1903), in the course of a study of bacilli belonging to the hog cholera group with special reference to their agglutinating relationship, discovered accidentally the existence of flagellar as well as body agglutinins distinct from each other. Without going into the details of their experiments, the conclusions may be thus summarised:—(1) The non-motile race and the motile races of the hog cholera bacillus manifest a close affinity towards one another in the presence of immune agglutinins. (2) This affinity enables us to separate the agglutinins of motile bacilli into flagellar and body agglutinins. (3) The agglutinins acting upon the bodies of the non-motile hog cholera bacillus is identified with that acting upon the bodies of the motile race or species, but different from that acting upon the flagella. (4) The flagella agglutinins are much more easily demonstrated in immune sera. In the cultures studied, the presence of the former was manifested in dilutions over twenty times greater than in those in which body agglutinins became visible. (5) In order to obtain body agglutinins, a much higher degree of immunity must be induced. (6) The assumption of two agglutinins will probably serve to clear up various apparent discrepancies in agglutination tests.

LABORATORY TECHNIQUE.

AN improvement on Romanowsky's stain. Zampilloni (*Policlin.*, Roma, July 27, 1903) uses a 50 per cent. methylene-blue and a 1 per cent. höchst eosine (Grübler), and mixes them when required in the exact proportion of 2 c.c. of the former and 0·78 c.c. of the latter. This gives excellently uniform results. A new method of staining flagella. Gemelli (*Gior. d. r. Soc. ital. d'ig.*, Milano, 1903, No. 2). The thin film is made upon a perfectly clean cover-glass, washed, put in a weak solution of permanganate of potash and immersed for fifteen to thirty seconds in a ¾ per cent. solution of chloride of lime, to which has been added a 1 per cent. watery solution of neutral red in the proportion of 1 in 20. Wash and dry with blotting-paper, and examine with cedar oil.

The human placenta as a culture media for bacteria. Vicarelli (*Gior. d. r. Accad. di med. di Torino*, July and Aug. 1903) has found the human placenta to be an excellent medium for the growth of the staphylococci, the micrococcus prodigiosus, the anthrax, the tubercle, and the typhoid bacillus and actinomyces, and this explains how grave infections follow upon a retained placenta. 250 grs. of placenta are added to 500 c.c. of water and boiled for forty-five minutes, filtered, and the filtrate made up to 500 c.c., then add 1 per cent. dry peptone, 5 per cent. sodium chloride, and 1½ per cent. agar or 10 per cent. gelatin.

DERMATOLOGY.

UNDER THE CHARGE OF

W. ALLAN JAMIESON, M.D., F.R.C.P.Ed.,

LECTURER ON DISEASES OF THE SKIN, UNIVERSITY OF EDINBURGH.

THE DERMATOSES OCCURRING IN EXOPHTHALMIC GOITRE.

ATTENTION has been directed to these by two observers in recent times, by Dore (*Brit. Journ. Dermat.*, London, October, 1900), and Hydé and M'Ewen (*Am. Journ. Med. Sc.*, Phila., June, 1903). One is pigmentation, often presenting bilateral symmetry. It may be localised or diffused. It may be simple, or Addison's disease may be associated. In other instances, leucoderma more or less widely distributed coexists. Other trophic changes have been noted, among them alopecia, and to this we may add hirsuties. Similarly the nails may atrophy and the teeth seem prone to become carious. But the commonest of the cutaneous manifestations is excessive sweating. This, of course, is apt to be most marked in severe examples, where there is tachycardia, pyrexia, and emaciation. In the great majority of cases the skin is in a constant state of moisture, and there are often profuse sweats, usually at night, coming on sometimes without apparent cause, sometimes on the slightest exertion or emotional excitement. Such being the case, it is not surprising that hydrocystoma has been encountered. Along with the sweating may be mentioned transient flushings of the face and subjective sensations of heat. More permanent redness may occur, and telangi-ectases, to a considerable extent, develop. There are numerous cases in which œdema makes its appearance. Apparently this may be of cardiac, of nervous origin, or be transitory. Local œdema of the eyelids may be an early or late symptom, and one which is very persistent. Other common sites are the hands, face and neck, ankles and legs. Some of the transient varieties are probably allied to angio-neurotic œdema or urticaria.

THE TREATMENT OF PIGMENTARY MOLES WITH MERCK'S THIRTY PER CENT. PEROXIDE OF HYDROGEN.

PIGMENTARY moles can often be successfully removed by electrolysis, but if very numerous the method is tedious, and not always quite satisfactory. The favourable results in at least two cases, by the application of a strong percentage of peroxide of hydrogen, recorded by Cohn (*Monatsh. f. prakt. Dermat.*, Hamburg, Oct. 1, 1903), is welcome. The manufacture of such a powerful solution has only recently been accomplished. It is sold in bottles containing 50 grms. These are closed and sealed with paraffin. The first case was that of a nine-year-old girl, the whole of the right side of whose face was studded with pinhead-sized dusky-brown moles, which were found also on the ear and both arms. Her mother stated that the earliest appeared in her second year, and since then others had gradually shown themselves. Of these a large number were treated by depositing a drop of the 30 per cent. solution twice daily on each by means of a glass rod. This was allowed to dry spontaneously, which it did in about fifteen minutes. The cauterised spots were then covered with zinc plaster muslin, or left alone. The application was repeated on several successive days till the moles vanished. In course of four weeks the greater number had disappeared, and the dispersal of the rest was then entrusted to the mother. The second was a girl of 5, who had dark-coloured moles from a linseed to a shilling in size, scattered irregularly over her whole body. These had a certain resemblance to urticaria pigmentosa, but no mast cells were discoverable on microscopic examination, while the appearances were those of pigmentary nævi. In this case also, within a week, many had disappeared completely under the use of the same solution. A hairy nævus, the size of a florin, was likewise satisfactorily treated in a similar manner, but the details are for the present withheld.

PRECANCEROUS KERATOSES.

HARTZELL (*Journ. Cutan. Dis.*, N. Y., September, 1903) observes that the most frequent, and perhaps, the most important form, the one to which the term precancerous is most applicable, since it is followed in so large a proportion of cases by epithelioma, is that so frequently seen on the face and hands of adults past 50, the so-called senile seborrhœa, the senile keratoma of Besnier. It occurs as somewhat elevated, friable, and slightly greasy, or hard and dry, yellow-brown, or black crusts, firmly adherent, and from a pinhead to a sixpence in size. When forcibly removed, the under surface shows numerous small spines, which have occupied the dilated mouths of the follicles, while the skin beneath is moist and red, sometimes bleeding a little, or not infrequently superficially ulcerated. There are usually no subjective sensations. The regions affected are, in order of frequency, the forehead, upper part of the cheeks, nose, back of hands, neck, and ears. Most common in those engaged in manual labour, or much exposed to weather, it is oftener encountered in men than in women. The course is variable. Many patches remain practically unchanged for months or years, a few are gradually transformed into superficial epitheliomatous ulcers, which slowly enlarge, or, becoming more elevated and wart-like, sometimes with a thick, horny covering, present all the characters of a papillomatous epithelioma. Sections from skin removed during life from five cases showed marked increase in the thickness of the corneous layer of the epidermis, the nuclei of the cells persisting as fairly well-stained slender spindles. The chief increase was about the mouths of the hair-follicles and sweat-ducts, and there too the granular layer existed, though elsewhere it had almost completely disappeared. In the newer lesions there was but slight increase in the width of the rete mucosum, though there was always evidence of cell activity in the basal cells, such as numerous dividing cells and multiplication of nuclei. In the older lesions there were all degrees of increase in the thickness of the rete up to actual invasion of the corium and commencing epithelioma. Except for flattening out, the corium showed little alteration. While the sebaceous glands exhibited nothing abnormal, the coil-glands and their ducts manifested changes in every case. In a lesion removed from the back of the hand, the upper part of the sweat-ducts, just before they entered the epidermis, was surrounded by an abundant cellular exudate. In lesions taken from the cheek, the coil-glands showed marked proliferation of the lining epithelium, with increase in the size of the cells, so that the lumen of the tube was frequently obliterated; other parts presented cystic dilatation, with flattening out of the lining epithelium. In fact, such change was so uniformly observed in the sweat-gland apparatus, that he was led to the conclusion that these structures probably play an important rôle in this form of keratosis, a conclusion further supported by the fact that in other forms of circumscribed keratosis, more especially arsenical keratosis, marked hyperhidrosis sometimes precedes the appearance of the keratosis lesions.

Mode of Using Radium.

At a time when the effect of radium on the tissues is in process of being tested, any information as to its mode of application and probable action is acceptable. Holzknecht of Vienna, at the meeting of the German Dermatological Society at Sarajewo (*Monatsh. f. prakt. Dermat.*, Hamburg, November 1, 1903) contributed some information. It is sufficient to place the very thinnest layer of the radio-active substance on the skin, so that all the rays from the under surface may be utilised. The mucous cavities of the mouth, nose, etc., are particularly suited for this mode of treatment, where the adjustment of the Röntgen or Finsen rays is difficult to arrange. Too deep penetration is hardly likely to occur, as, notwithstanding the permeability, 99 per cent. of energy is lost. To produce a skin reaction, an application of ten minutes' duration is sufficient. This procedure seems less well adapted for epithelioma than the Röntgen rays. In the discussion, Petersen, Neisser, Pick, and Weidenfeld alluded to the occurrence of ulceration after this method of treatment, and especially to the specific action of the radium rays on the cutaneous vessels. Some indications may also be obtained from an article on radium by Cleaves (*Med. Rec.*, N. Y., October 17, 1903), who tried a glass tube containing 15 grs. of radium bromide of 7000 radio-activity in a case of sarcoma of the mouth and face, and in one of pelvic epithelioma. The pain in the first case was relieved by two exposures of ten minutes, the discharge and the ulceration in the second seem to have been benefited by two exposures on successive days for five minutes. The writer, however, appears to think that the interval should have been longer, though no harm resulted.

The Histo-Pathogenesis of Psoriasis.

On this point observers are divided into two pretty equal camps, one maintaining the opinion that the diseased process commences in the derma, subsequently involving the epidermis; the other, that it is to be regarded as a primitive trophic disturbance of the cutaneous epithelium. Verotti of Naples (*Ann. de dermat. et syph.*, Paris, August, September, October, 1903) has set himself to determine the question, and concludes as follows:—The histological peculiarities of psoriasis, in order to be appreciated in their essence, ought to be considered with respect to the phases of evolution and involution of the disease. The psoriatic process may be divided into three periods—(*a*) Initial. This may be studied in the cutaneous zone immediately surrounding the psoriasic spot, and which appears healthy clinically (peripsoriasic zone). The circulatory disturbances, most accentuated in the middle and deeper parts of the corium, form the most prominent histological feature, and the epidermic lesions are reduced to commencing proliferative activity of the rete Malpighii without any apparent disturbance of keratinisation. (*b*) Active period or acme. This can be studied in the peripheral zone of the spot (psoriasic zone properly so called). The circulatory disturbances are more pronounced in the papillary and subpapillary layers. In the epidermis the parakeratosis is fully developed, and the scales are plentifully infiltrated with leucocytic residues. (*c*) Regressive or involutive period. This can be studied in the central zone of the fully developed spot. The circulatory disturbances are less pronounced in the papillary body, while the proliferation of the rete Malpighii is more accentuated than in the preceding zone, the size of the papillæ is reduced, and the parakeratosed scales are infiltrated with a small number of leucocytic residues. The priority of the dermic alterations is demonstrated by the following histological lesions:—(*a*) The notable degree, in the peripsoriasic zone, of vascular disturbance (chiefly vasodilatation), in the deeper and middle layers of the corium, relatively to the proliferative activity, still at its commencement, of the corpus mucosum, with morphological integrity of the horny layer. (*b*) The progressively ascending character of the vascular disturbances (from the hypodermic plexus, and the communicating branches to the subpapillary plexus and the papillary vessels), which one can follow in succession from the peripsoriasic to the psoriasic zone. (*c*) The perivascular infiltration, which is the most remarkable character of the psoriasic zone, and is more pronounced in the subpapillary layer than in the papillæ, when the process can be detected at its commencement. (*d*) The quality and the degree of these two orders of epidermic alterations (active or proliferative, passive or atrophico-degenerative) are in intimate relation with the intensity of the papillary circulatory disturbances. (*e*) The morphological modifications of the papillæ, and of the interpapillary cones in the three zones, depend on the hydraulic variations of the plasma exuded into the papillæ themselves. (*f*) The tumultuous and disorderly type of leucocytic migration in the first evolutive period of the process, when the epithelial proliferation is still in its commencement, is in direct relation with the vascular disturbances of the subpapillary and papillary layers. It lessens when the epithelial proliferation attains such a degree as to oppose an obstacle to the leucocytic migration. The psoriatic process, from the histological point of view, commences as a congestion, fluxionary throughout the whole derma, and assumes the character of an inflammatory process in the subpapillary and papillary zone, determining there in the rete Malpighii, by the mechanism of vacuolar degeneration and proliferative reaction, a series of modifications whose result is parakeratosis. In psoriasis, the conception of a toxæmia presiding over the production of the cutaneous lesions, is justified by the nature and evolution of the histological changes.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

G. H. MELVILLE DUNLOP, M.D., F.R.C.P.Ed.,

PHYSICIAN, ROYAL HOSPITAL FOR SICK CHILDREN, EDINBURGH.

PAROXYSMS OF WHOOPING-COUGH TREATED BY PULLING THE LOWER JAW DOWNWARD AND FORWARD.

THE great aim in the treatment of whooping-cough is the lessening of the number and intensity of the spasms, as it is found that the frequency of the complications is largely dependent upon the severity and duration of those attacks. In some children the attacks are so severe that they end in convulsions, so that it is well to know any method by which they can be checked.

Sobel (*Arch. Pediat.*, N. Y., June, 1903) claims that the paroxysms can be relieved by pulling the lower jaw downwards and forwards after the manner practised in the case of a narcotised patient who is not breathing properly.

This method was first suggested by Naegeli in 1889, but since that time there has been little reference to it in medical literature, and no mention of it in the standard works on Pediatrics.

Sobel tried this method of relieving the paroxysm in ninety-six cases of whooping-cough, and only met with nine cases in which it was not successful. The ages of the patients ranged from 3 months to 8 years; no selection of cases was made, and all stages were observed. As a rule, the treatment was more successful in the older children, but in some quite young children it acted remarkably well. In cases without the whoop, the expiratory spasm with its accompanying asphyxia was generally overcome. The author maintains that patients treated in this way are less likely to suffer from complications or sequelæ than those treated only medicinally. The method is deserving of a place in the treatment of pertussis, and has much to recommend it, being harmless, painless, and easy of application. The only contra-indication to it is the presence of food in the œsophagus or mouth. Mothers and nurses should be instructed in the performance of the method recommended in this paper.

DIAGNOSIS OF TUBERCULOUS PERITONITIS IN CHILDREN.

KISSEL, as a result of the study in fifty-four cases of tuberculous peritonitis, reaches the following conclusions:—(1) Tuberculous peritonitis is more common in children than is generally supposed. (2) It can be laid down as a general rule that all cases of so-called spontaneous ascites are really due to tuberculous peritonitis. (3) Not infrequently the exudate in the peritoneal cavity will disappear under general tonic treatment, and the child will regain complete health. (4) In the majority of the cases the onset of the disease is imperceptible. The parents first notice that the child becomes pale and thin without apparent cause. (5) The presence of a coincident serous pleurisy is strong confirmatory evidence in the diagnosis of tuberculous peritonitis. (6) Thickening of the parietal peritoneum is the most valuable sign in the diagnosis. This can be readily elicited, before adhesions have formed, by picking up a fold of the anterior abdominal wall and palpating the peritoneum between the thumb and fingers, provided the examiner is accustomed to the palpation of the normal peritoneum. (7) In exudative tuberculous peritonitis, the fluid obtained by tapping is rich in albumin, and has a high specific gravity. (8) In many patients who present no subjective symptoms, and only moderate objective symptoms, the whole peritoneum is covered with a thick layer of tuberculous masses. (9) Only in rare cases does tuberculous peritonitis have a severe onset.—*Arch. f. klin. Chir.*, Berlin, Bd. lxv. Part 2.

SPONTANEOUS HÆMORRHAGES IN NEW-BORN CHILDREN.

IN the *Journ. Am. Med. Assoc.*, Chicago, Abt reports in detail twelve cases of spontaneous hæmorrhage in new-born children. The hæmorrhages occurred from the mucous membranes, from the navel, or into the skin and subcutaneous tissues. Four of the cases recovered, eight died. The theories of the causation of melæna are discussed. Landau's theory that the hæmorrhages are caused by ulcers of the stomach produced by emboli has been discarded. Congenital syphilis is the explanation of a number of cases. Two at least of Abt's cases were due to this cause. Mracek, who examined nineteen cases, found changes in the blood vessels in 14 per cent. The changes included endarteritis of the small and medium-sized blood vessels in the submucous tissue of the alimentary tract. The most striking changes were in the capillaries. In recent times the tendency has been to ascribe these cases to infection, and various organisms have been isolated from the blood and tissues of fatal cases. Micrococci, diplococci, and streptococci, the bacillus pyocaneus, the colon bacillus, and other organisms have been found. It is improbable that there is a specific organism, and the hæmorrhages are probably a result of any one of those infections. In the treatment, internal remedies are of no avail. The local treatment by styptics, including the extract of the suprarenal gland, is without permanent effect. A pad of sterile gauze may be soaked in a 10 per cent. solution of gelatin, in normal salt solution, and applied to bleeding areas. Injection of a 2 per cent. solution of gelatin, in normal salt solution repeatedly sterilised, may be given. From 25 to 50 c.c. of such solution may be given to a new-born child, and repeated daily. These measures are warmly recommended, and there can be no objection to their use. In syphilitic cases vigorous specific treatment should be given.

The Bacteria in the Summer Diarrhœas of Infants.

Drs. Duval and Bassett publish (*Centralbl. f. Bakteriol. u. Parasitenk.*, Leipzig, December, 1902), a report of their study of the bacteria found in a number of cases of summer diarrhœa of infants. In forty-two typical cases they succeeded in isolating the Shiga bacillus of dysentery. They secured the specific organism also from scrapings of the intestinal mucous membrane at the autopsy, and in one case from the mesenteric glands and liver. In the stools of acute cases the organism was often present in large numbers, but in those of mild cases, and also in those of long duration, it was often secured with difficulty, because of its presence in relatively small numbers, and also because of the antagonism of the normal intestinal bacteria. The specific bacilli isolated from different cases proved to be identical, and to agree in all ways with those isolated from cases of acute dysentery in adults by Shiga in Japan, Flexner and Strong in Philadelphia, and Kruse in Germany. It was not found in the stools of twenty-five healthy children, nor in those of simple diarrhœas, marasmus, and malnutrition. Agglutinative reactions were obtained when the organisms were tested with—(1) Blood serum of patients from whom they were secured; (2) the serum of other infants suffering from summer diarrhœa; (3) the serum of patients with acute dysentery. They conclude that the summer diarrhœa of infants is etiologically identical with the acute bacillary dysentery of adults. Holt (*Arch. Pediat.*, N. Y., November, 1903), in a discussion on the bacillus of Shiga, states that he had studied bacteriologically the stools from 112 children, taken at random, suffering from all kinds of intestinal disturbance. The Shiga bacillus was found in thirty-seven cases. All these thirty-seven cases had symptoms of colitis, and most of them were acute, beginning with fever, which was frequently as high as 103° F. The stools showed much mucus, and often contained blood. In no case where both blood and mucus were present was the organism absent, although it was not found in all the cases where the stools contained mucus, even though the quantity of mucus was considerable. Characteristic blood reactions were obtained in all the cases. These were irregular in their appearance during the first week, although they were obtained in one case on the second, and in another on the third day of the attack. During the second week most of the cases gave positive results. The reactions were present in one case, when discharged from hospital, twenty-seven days after the attack. The bacilli persisted in the stools for a considerable time after the attack; in one case they were found six weeks, and in another four weeks, after the attack. There were no characteristic anatomical changes discovered at the autopsies accompanying this form of infection. Nearly all varieties of inflammation were met with except the croupous form. Flexner's antidysenteric serum was used in eight cases. In three of these very striking improvement appeared to follow its administration. Two children were practically moribund when it was given; in three others no effect was seen. The number of cases is too small to admit of any deductions; but Holt is doubtful whether we shall see the same striking benefit which follows the use of diphtheria antitoxine.

REPORTS OF THE MEDICAL SOCIETIES.

◆

Edinburgh Medico-Chirurgical Society.—*Wednesday, December 2, 1903.*—Professor **Chiene**, C.B., President, in the chair.—Dr. **Dawson Turner** showed a case of lupus erythematosus treated by the cathode breeze.—Dr. W. **Allan Jamieson** showed—(1) A case of fungating rodent ulcer cured by X-rays; (2) a case of long-standing chronic infiltrated eczema treated by pilocarpine.—Mr. **Struthers** and Mr. **Miles** showed four patients illustrating the results of Bennett's fracture.—Dr. **George A. Gibson** showed a case of early acromegaly.—Mr. **David Wallace** showed microscopical sections and specimen from the case of congenital hypertrophy of the tongue, shown at previous meeting.—Dr. **Hill Buchan** showed microscopical specimens from a case of asthma.—Mr. **Miles** and Mr. **Struthers** showed a series of metacarpal bones of the thumb, illustrating Bennett's fracture, with stereoscopic photographs and radiograms.—Dr. **Chalmers Watson** read a paper on "Some new Observations on the Pathogenesis of Gout." He showed tissues taken from a young adult fowl which had succumbed, after a short illness, to naturally acquired gout. Such cases were very rare in the records of the disease, and, so far as the author was aware, never had been submitted to a complete histological examination, as in the present case. The naked-eye appearances, seen at the post-mortem, were—alteration of the synovia to a cream-like fluid, which gave the muroxide reaction, deposit of uric acid in combination in the tissues around the smaller joints, recent pericarditis, widespread thrombosis, and areas of necrosis in the kidneys. Microscopical examination revealed an intestinal catarrh and congestion of the abdominal organs generally. These appearances indicate a bacterial infection, and Dr. Watson urged that more attention should be directed to comparative pathology as the means most likely to advance our knowledge of the disease. Dr. Watson concluded by referring to the blood changes in acute gout in man, and suggested that the appearances found in the pancreatic ducts in the case described may have some significance in connection with gouty glycosuria. Dr. Gulland criticised the paper.—Dr. C. B. **Ker** read a paper on "The Open-air Treatment of Broncho-Pneumonia complicating Whooping-Cough." Whooping-cough among the poor is a very serious disease. The mortality up to 5 years of age is 0·48 per mille, that is about one-third of the total death-rate from zymotic diseases. This great mortality is chiefly due to broncho-pneumonia, the other conditions chiefly responsible being meningitis and tuberculous disease. Fever hospital death-rate is high compared with that occurring in private practice, because (1) the worst cases are sent to hospital; (2) children from other hospitals are sent in, *i.e.* patients already suffering from other diseases. The mortality in Edinburgh City Fever Hospital for eight years previous to 1900 was 18·11 per cent.; in Glasgow Fever Hospital for past twenty-two years, 18·3 per cent. The indications for treatment are—(1) To maintain the strength—this is difficult on account of the frequent vomiting; (2) to get sleep—the difficulty here is that sleep is frequently interrupted by the paroxysms of coughing. Tuberculosis is very apt to follow. Dr. Ker had tried all sorts of drugs for whooping-cough, and only one was found to be of any service, namely, belladonna, which seemed to relieve the paroxysm. In broncho-pneumonia he had also tried several forms of treatment, such as poulticing, ice, steam, etc., and found all equally bad or good; two-thirds of the cases died (71 per cent.); in Glasgow the case mortality was 76 per cent. He was induced to try the open-air method of treatment on account of the frequent occurrence of tuberculosis. There is no contra-indication except laryngitis and convulsions. This treatment had practically no effect on the severity of the paroxysms. The temperature was also unaffected, but the appetite became voracious. The general health improved markedly. The patients also slept better. The risk of subsequent tuberculous lung disease was much diminished. No bad results were observed. There was a marked improvement in the death-rate, which fell to about 25 per cent. from 71. Broncho-pneumonia of hospital origin had become extinct. The treatment is to be regarded as a striking success.—Papers were also read by Dr. DAWSON TURNER and by Messrs. MILES and STRUTHERS.

CLINICAL MEETING.—*December* 16, 1903.—Professor CHIENE, C.B., President, in the chair.—Mr. CATHCART showed—(1) A patient after removal of calculus from the common bile duct; (2) a patient with a remarkable tumour of the head.—Mr. COTTERILL showed—(1) A case of recurrent sarcoma of the shoulder, under treatment by X-rays, showing marked improvement; (2) a boy after enterectomy for tuberculous stricture; (3) a patient after laminectomy for paralysis of two years' duration; (4) a patient with a tumour of the right frontal region.—Dr. HENDERSON SMITH (for Dr. G. A. GIBSON) showed—(1) A case of peripheral neuritis produced by arsenic, in a patient under treatment for chorea, by the administration of liquor arsenicalis; (2) a case of aberrant ocular and facial paralysis. Dr. LOGAN TURNER showed—(1) A girl, æt. 12, after operation for extensive osteomyelitis of the temporal bone, not involving the middle ear; (2) a girl, æt. 10, after operation for mastoid abscess and lateral sinus phlebitis, with ligation of the internal jugular vein.—Dr. FLEMING (for Dr. BRUCE) showed—(1) A young woman suffering from paralysis agitans; (2) a case of post-hemiplegic tremor.—Mr. ALEXIS THOMSON showed—(1) A patient after partial gastrectomy for cancer; (2) a boy, æt. 18, after operation for perforated gastric ulcer.—Mr. CATHCART (for Mr. CAIRD) showed—(1) A patient after removal of malignant stricture of the pylorus and malignant stricture of the jejunum; (2) two patients after gastro-jejunotomy for hæmorrhage; (3) a patient after operation for hour-glass contraction of the stomach; (4) a boy with double coxa vara, simulating double congenital dislocation of the hip.—Card specimens were exhibited to illustrate cases shown by Mr. Alexis Thomson and Mr. Caird.—Mr. COTTERILL showed the following specimens—(1) Fracture of the seventh cervical vertebra, causing division of the cord; (2) stricture of the small intestine from a case of tuberculous peritonitis; (3) specimens from two cases of ectopic gestation; (4) prostate removed from a patient, æt. 75; (5) chondro-sarcoma of the leg.—Mr. CATHCART showed—(1) A plate of teeth swallowed and vomited up; (2) Edebohl's cushion for operations on the kidney; (3) remarkable chart from a case of a burn.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*December* 11, 1903.—Dr. MUNRO KERR showed—(*a*) A patient on whom he performed hysterectomy for rupture of the uterus. The patient was æt. 41, and the pregnancy was the tenth. A midwife had been in attendance twenty-four hours when the doctor was called. The doctor found an impacted transverse presentation, turned and delivered. On account of some difficulty with the placenta, he introduced his hand into the vagina and found intestine in it. He at once had the patient removed to the Maternity Hospital, where Dr. Kerr operated 2½ hours after the diagnosis was made. On opening the abdomen, Dr. Kerr found a transverse tear at the junction of the body and lower uterine segment, and a longitudinal tear extending from the lower uterine segment into the body. He then did a Porro operation, with intraperitoneal treatment of the stump. The patient made a good recovery. (*b*) A broad ligament cyst removed from a patent, æt. 74 years. The broad ligament was opened, and the cyst shelled out. The cavity was packed and stitched to the lower end of the wound. Hypostatic congestion of the lungs set in, but a good recovery followed. (*c*) A large myoma of the uterus, which had extended retro-peritoneally, and which was removed by enucleation. After the tumour was enucleated, the uterus was stitched to the anterior abdominal wall, and the capsule of the myoma was drained through the vagina.—Dr. LESLIE BUCHANAN read notes on a case of contusion injury to the eye. The patient, a male, æt. 17, received a blow on the left eye from the butt-end of a billiard cue. Immediately after the accident he could only see a dim glare. Next morning the vision was no better. On examination at the Eye Infirmary he could only distinguish fingers at 2 ft. with the injured eye. There was no ecchymosis of the lids or conjunctiva. The cornea was clear, and the anterior chamber normal. With the ophthalmoscope the following conditions were observed: The lens was in position, and the vitreous clear. The optic nerve was dim in outline and deeply congested; the blood vessels were healthy. Round the macular area was a dense opacity, and radiating from it a number of white lines. The diagnosis was made of œdema of the retina, with effusion under the retina. Atropine was administered locally. A week afterwards vision was much improved; the central opacity had almost disappeared, but a small hæmorrhage was visible at the upper part of what had been the opacity. At the end of another week the vision was again much improved (2 D–5 D); the white lines were gone, and the hæmorrhage almost gone. Small white spots were to be seen in a line across the macular area. Twelve weeks after the accident no evidence of the injury was present, except a slight ovalness of the pupil and a few small white spots in the macular region. Two years after the accident the vision was practically normal.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*December* 14, 1903.—Professor MUIR in the chair.—Dr. JOHN ANDERSON showed organs from a case of supposed splenic anæmia.—Professor MUIR showed a liver containing very large carcinomatous tumours, secondary to an adeno-carcinoma of the sigmoid flexure. Patient was only 26 years old, and the disease ran its course in three months; there was no jaundice.

Weight of liver, 14 lb.—Dr. **Barlow** showed a specimen of enteric intussusception successfully treated by resection of the bowel, and read a short account of the case. The intussusception was very tightly strangled: it contained fully 15 in. of intestine.—Mr. R. H. **Parry** showed—(*a*) A tumour of the prostate removed by Freyer's method; (*b*) A large fæcal concretion which was lodged in the cæcum, and which necessitated excision of the cæcum. The symptoms pointed to malignant disease in the cæcal region, but microscopic examination of the specimen showed nothing of this nature. The operation was successful. —Dr. J. **Lindsay Steven** and Dr. **Workman** described the clinical features of, and showed the heart from, a case of sudden death, caused by embolism of the main trunk of the left coronary artery.—Dr. **Carstairs Douglas** communicated a short note on the ortal reaction for milk, and demonstrated the test. It enables a distinction to be made readily between fresh milk and milk which has been pasteurised at too high temperature. The fresh milk gives a brick-red reaction on the addition of ortol and peroxide of hydrogen, while the pasteurised or boiled milk remains colourless. The importance of this in relation to infantile scurvy was discussed.

Forfarshire Medical Association.—*December* 11, 1903.—Dr. **Graham Campbell**, Vice-President, in the chair.—Dr. **Rogers** showed a patient with a cirsoid aneurysm under the left eye of five years' duration, and with no history of injury.—Dr. **Mackie Whyte** showed a case of Raynaud's disease in the hands of a girl, æt. 19, of about three weeks' duration, and now in the stage of asphyxia.—Dr. **Foggie** showed an X-ray photo of the chest of a case of congenital dextrocardia without transposition of viscera. The child suffered from shortness of breath, had anxious look, frequent bronchitis, and distension of the veins of the neck.—Dr. **Stirling**, Perth, gave an account of a case of gastric ulcer with perforation, which he had treated by suturing. The convalescence was delayed by diaphragmatic pleurisy.—Dr. **Templeman** introduced the subject of the municipal supply of sterilised prepared milk. He emphasised its importance, and pointed out the success which its adoption in Liverpool, Battersea, and Leith had met with. He mentioned it as one possible preventive against the growing infant mortality in this country, and especially in our own city.—Dr. **Buist** proposed a resolution pledging the meeting to support Dr. Templeman, and approving of his scheme. Dr. **Mackie Whyte**, in seconding, said he thought medical men should disabuse their minds of the idea that sterilised milk in infant feeding caused infantile scurvy, and quoted Sir Thomas Barlow in support. The infantile scurvy had been caused by too long feeding on malted foods. This resolution was adopted unanimously.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

The Edinburgh Royal Infirmary.

DURING a considerable part of last year there was much discussion in consequence of certain new proposals by the Managers of the Royal Infirmary of Edinburgh, as regards the limits of appointments held by the honorary medical and surgical officers. The matter could not be regarded as finally settled until the suggested arrangements of the Managers had obtained the approval of the Court of Contributors, and so long as it was thus *sub judice* it seemed to us advisable to express no opinion on the merits of the question. As it has now, however, been openly debated at the annual meeting of the General Court of Contributors, the subject may well be regarded as having been thrown into the arena of public discussion; we have accordingly no hesitation in frankly expressing our views upon the whole situation of affairs that has been brought about by the action of the Managers. In dealing with the subject, it is absolutely necessary, in order to have a clear view of all its bearings, to recall the chief stages of the proceedings which have led up to the present situation.

In the end of March, without any official consultation with the honorary officers, the Managers sent an intimation to the Secretary of the Medical and Surgical Staff, for the information of the various members of that body, that, from the 1st April, the physicians and surgeons would cease to hold office, on attaining the age of 60; the rule, however, not to be applicable to those in charge of wards who were in their second or third term of five years, or to those engaged as clinical professors. At the same time, the Managers informed the senior assistant physician and senior assistant surgeon, by a direct communication, that, from and after the date already mentioned, they, as being in charge of the wards set apart for the instruction of women, would rank as physician and surgeon respectively, and their terms of office in charge of these wards would count as part of the total period of service. It is not surprising that this deliverance created something like consternation; even in the minds of those who were but little affected by the new rule, or not affected at all, surprise mingled with regret. Representations were made by the Medical and Surgical Staff to the Managers; conferences were held between the Managers and the Staff; and the result was, the decision of the Managers to fix an age limit of 65, not extending its operations to the professors or to ordinary physicians and surgeons in their second or third term of five years' service. In this way ended the first act of the play.

On 4th January of the present year, the enactments of the Managers came up for approval by the Court of Contributors. At this meeting of the Court a motion was adopted, by a large majority, extending the operation of the rule regarding an age limit to the professors, and, in accordance with use and wont, the matter was remitted to the Committee of the Court, to be reported on at an adjourned meeting on 18th January. The whole subject was most tersely summed up by the committee, in the following way:—

"The Managers report that they have, after most careful consideration, made a new rule, to the effect that the ordinary physicians and surgeons shall in future retire on reaching the age of 65; the Contributors may be reminded that any new rule requires to be passed by the Court of Contributors. At the meeting of Contributors, held on 4th January, a motion was carried, which enacted a new rule, putting the Professors of the University who hold wards in the Infirmary, on the same footing as regards an age limit, as the medical and surgical officers who would be affected by the new rule framed by the Managers. That new rule, although referred to in the motion as to an age limit for professors, and therefore possibly by implication approved of by the Court of Contributors, has not been formally sanctioned by the Court, and technically it may be open to question whether the new rule as to the professors was in order in being passed.

"The matter appears to the committee to be very difficult and delicate, both as regards the physicians and surgeons and the professors, and the committee do not, at this stage at all events, presume to offer any opinion upon it; but in reporting to the contributors on the proposed new rule, as they are by precedent bound to do, they venture to suggest to the contributors that they should in the meantime delay to deal with the new rule proposed by the Managers, and allow further time to consider the whole matter; it is of serious importance, and ample time ought in their view to be allowed for consideration and discussion. As regards the rule affecting the professors, it has to be observed that although it was carried by two to one, only sixty-nine contributors took part in the division; and it seems most desirable that the whole question should be fully ventilated, and that a more adequate representation of the views of the contributors should be obtained on an important matter affecting the welfare of the Institution.

"The committee beg to suggest that it might be desirable to appoint a small joint-committee of the Managers and members of the Committee of Contributors to consider the whole matter, and make a report to a future meeting of contributors."

At the adjourned meeting, the suggestion of the committee was carried by a majority of almost two to one, and it was decided to discuss the whole subject at another adjourned meeting to be held in April.

The questions involved are certainly of considerable difficulty, and require not only a large mind but also at the same time the most delicate tact. Of the various issues involved, a few principles, however, seem to us to stand out with great distinctness, and to them we desire to direct attention.

In the first place, it cannot be gainsaid that the welfare of the sick poor is the first consideration for everyone who is connected with the Royal Infirmary. In 1682, when the Royal College of Physicians appointed some of the Fellows "to serve the poor of the city and suburbs," and again in 1725, when the College proposed the foundation of an Infirmary for the sick, and arranged that all the Fellows in rotation should act as physicians to it, the idea of caring for the sick poor was paramount. It is to-day still the foremost consideration.

The education of the medical student is the subject which most nearly approaches that just mentioned in importance. Since 1748, when John Rutherford began regular clinical instruction in medicine, and 1769, when James Rae instituted a similar course in clinical surgery, those who have guided the destinies of the Royal Infirmary have been imbued with an earnest desire for the progress of medical education.

Another matter, which can more easily be lost sight of, is that every member of the Medical and Surgical Staff has certain personal interests which must be safeguarded. The various members of the staff have been elected to their different positions in consequence of their special fitness. They have, without exception, made many sacrifices in order to render themselves eligible for and worthy of these posts. They have, in short, shaped their lives in such fashion as would render their education and training of special use to them in serving the Infirmary, and these particular qualifications would certainly be of much less importance to them in other medical walks of life.

Such are the three principal considerations which seem to us the necessary basis for any discussion on the recent policy of the Managers. Any proposed alterations that may affect the relations of the institution, even to one of these factors, should only be entered upon after the most careful inquiry into every effect of such changes, and the most serious reflection upon these in all their bearings.

Now, there cannot be a doubt that the Managers, collectively and individually, are solely actuated by a sincere desire to do everything in their power to further the interests of the great institution which they are called upon to administer. This is a fact universally recognised in all the discussions arising out of their decision. In other words, their good faith has never been questioned, but undoubtedly their wisdom and tact have been seriously impugned. It has been felt by every member of the Staff that before entering upon any new experiments, affecting their relations to the Infirmary, the Managers would have acted at once more wisely and more considerately if they had taken counsel with those whom the proposed changes would most seriously concern. In writing this, which is after all only a repetition of what we have previously stated in public, we do not for a moment intend to advance the contention that the Managers had not a perfect right to take the course they did, *i.e.*, that their decision was *ultra vires*; far from this, we fully recognise that, with the approval of the Court of Contributors, they were legally entitled to enact regulations such as they promulgated. But to launch such new regulations, without due consideration of their effects, was unwise; to do so without consultation with those whom it would chiefly affect, was inconsiderate; and to neglect the interests of certain of the Staff who would be vitally affected, was invidious.

We are strongly of opinion that the new age limit should not have been made to apply to any of the present members of the Staff; in other words, its operation should not have been retrospective. Had there been such a regulation in force, when certain of the honorary officers were training themselves for their present posts, assuredly they would have shaped their lives differently. To apply such a drastic rule to them is simply to render much of their long course of preparation futile, and to rob them of the results of their labours. But if it seemed necessary that an age limit should be imposed upon the present incumbents of the hospital posts, it should have been made applicable to everyone, without fear or favour, always excepting those who were serving a fixed term of appointment. With this one exception, the proposed new rule should have been applied to ordinary and professorial members of the Staff alike. In virtue of his office a professor cannot be held to have earned immortality or to have escaped the common failings attendant upon senility. He should not, therefore, have been held exempt. It may be that the Managers doubted their right to make any regulations affecting the clinical professors. This they need not have done, as there is a precedent for dealing with any clinical professor who may be considered incompetent. If a man at 65 ceases to be fit for further duty, his unfitness will not be less evident in a professorial capacity, and there is thus no reason for invidious distinctions.

To our way of thinking, the whole agitation has from first to last been based upon misconception, and the main object has been lost sight of. Instead of keeping in view primarily the efficiency of the Staff, with a view to the care of the patients and the conduct of education, the one aim has seemed to be an attempt to hurry up promotion, without respect for the interests of the present incumbents. In the present age it must not be forgotten that the period of preparation for scientific posts is more lengthy than in any previous epoch, and that men must therefore be older before they are fitted for such offices. On the other hand, it is undoubted that the span of human life is steadily lengthening, and that old age comes more gently upon us. It has in fact been well said that the present era is a period of old men. To make an arbitrary rule, therefore, terminating a man's period of active work at 60 or 65 is, on strictly scientific principles, absurd. We sincerely hope that the Court of Contributors, at the adjourned meeting in April, will ordain a return to the state of matters in operation before the present agitation set in, as we are confident it is more satisfactory for the welfare of the entire Medical School of Edinburgh.

The Nature of Man.

TOLSTOI, in his reactionary mood, declared that science has made the lot of the majority of men worse, not better, and Brunetière proclaimed the bankruptcy of science because it is powerless to solve the only problems that are essential, or to do anything for morality. Both expected from science what it is not her direct function to provide, namely, a solution of the aim and destiny of human life, and both were bitterly disappointed. They echoed the old cry, that increase of knowledge means increase of sorrow. "Serum-therapy," said Brunetière in answer to Richet's defence of the utility of science, "serum-therapy cannot prevent us from dying, nor tell us why we must die." Unable to satisfy the hunger of the soul with the husks or formulæ which science provides, finding "that the absurdity of life is the sole indisputable bit of knowledge open to man," these two prodigal children wisely returned to the household of faith, which they should never have left. After they had become comfortable again, they naturally reviled the fare in the search of which they had spent many prodigal years, apparently quite convinced that their search had exhausted the possibilities of betterment which science has to offer. This was, indeed, far from being the case, for while science has, when true to its own aims, no intention of offering ultimate explanations of either man or the world, or of competing with philosophy and religion in suggesting transcendental interpretations, which make man's outlook clearer and more hopeful, yet it has made contributions towards practical, emotional, and intellectual ideals, which have helped men to live more effective, happy, and lucid lives. And it is here that the recent notable work of Metchnikoff comes in, to show how, altogether apart from faith, science can do much to ameliorate, to guide, to vivify, and to steady our human life. We do not agree with him, that man in his best moods is at all likely to dispense with transcendental interpretations of the world and of himself, or that "the age of faith has gone by," or that the only satisfaction remaining to man's restless spirit is "faith in the all-powerfulness of science"; for we have what seem to us good reasons for thinking that religion and philosophy are just as necessary and natural expressions of the developing human spirit as art and science are; but we do agree with him in his conviction that those who ruthlessly proclaimed the bankruptcy of science had made a very imperfect acquaintance with the assets, in estimating which we should go even further than the illustrious author has done.

The name of Elie Metchnikoff is known wherever natural science is cultivated, as that of an expert zoologist, bacteriologist, and physiologist, a genius full of bright ideas, of which his theories of phagocytosis, inflammation, and immunity are famous examples. And now, having done great service to humanity, having won immortal laurels, he has settled down to think it all over, and to think of the aged yew-tree and the cypress too. He has been pondering, to good purpose, over old age and death, laying bogeys by subjecting them to scientific analysis; and everyone will hope that he is renewing his youth, if, indeed, he has ever lost it. "These piquant and learned 'Studies of Human Nature,'" as the *Times* reviewer puts it, "are the recreations of a naturalist, the *parerga* of a thinker who, having sought and found in more than one department of human knowledge—zoology, microbiology, medicine—at fifty years of age, follows Renan's advice, and sits down for awhile to rest by the wayside of the Via Sacra, in order to reflect on the vanity of received opinions."

In the first section of his book ("The Nature of Man: Studies in Optimistic Philosophy," translation edited by Dr. P. Chalmers Mitchell, London, 1903), Prof. Metchnikoff discusses the "disharmonies," or, as we should say, imperfections of adaptation, which are evident when we consider man as he is at present constituted. Man has evolved rapidly from a Simian stock, he "is a kind of miscarriage of an ape, endowed with profound intelligence and capable of great progress." "He has inherited a constitution adapted to an environment very different from that which now surrounds him." "The sudden change in his natural conditions has brought about a large series of organic disharmonies, which become more and more acutely felt as he becomes more intelligent and more sensitive," *e.g.*, disharmonies in the sexual functions, and in the morbid nature of old age, and in the absence of any instinct of natural death. In regard to this position, we would observe that many who have given considerable attention to the subject would date the emergence of man as such about half a million years ago, and that in any case his ascent cannot be very appropriately called "sudden," whatever his origin may have been. In a few years man has done wonders in adapting domesticated animals to his wishes; why has he not, in many hundreds of centuries, done more with himself in removing his "disharmonies"? It is answered that he is a slowly reproducing, slowly variable organism; that his progress has been more in establishing an external social heritage, to which he is plastic, than in establishing organic constitutional variations; and that he has, for many reasons, only recently begun to think of himself as a possible subject for evolutionary experiments. From another point of view it seems only fair to emphasise the obvious fact, that the present-day environment to which man is, according to Metchnikoff, so imperfectly adapted, is, in great part, of man's own making, is an expression of himself, and cannot be abstracted from him. It is this power of making his own environment which has been man's snare as well as his differentiating prerogative, and we must not condemn nature's strategy because man so plainly shows the defects of his qualities. We must admit that the evolution of the social heritage of customs and conventions, institutions, and organisations, not to speak of art and science, has outrun the evolution of the organic heritage, but slowly variable man is extraordinarily modifiable and plastic, and we cannot but admire his power of individual adjustment as much as we regret the organic disharmonies, from the vermiform appendix to his unpunctuated sexuality, which are due to the fact that constitutional variation fails to keep pace with environmental change.

Man is imperfectly adapted—(1) In his alimentary system, from his teeth to his appendix, and further down; (2) in his reproductive system, *e.g.*, the hymen and menstruation in women, or the disharmony between sexual impulse and fitness to propagate in man, and in the family instincts in both; (3) in the instinct of self-preservation, as illustrated in unconscious pursuit of what inevitably means a morbid senility instead of a normal senescence, and in the apparent "impossibility of reaching the instinct of natural death." These last-mentioned disharmonies have "produced the childish and erroneous conceptions of the immortality of the soul and of the resurrection of the body, and many other strange doctrines that have been imposed upon us as revealed truth." "Finding the restoration of the much-desired harmony beyond its reach, humanity became resigned to a passive fatalism, and believed even that the existence of man was a kind of bad joke, a *faux pas* in the evolution of sentient organisms." It has lost patience with the slow, halting answers of science, which it finds "futile and of little interest," and so "from time to time it has preferred to turn back, and to delude itself with the beautiful mirages offered by religions and systems of philosophy." Thus the second section of Metchnikoff's book is devoted to a discussion of religious and philosophical systems, as attempts to diminish the ills arising from the disharmonies of the human constitution.

What the author says is splendidly vivid, often lurid; he exhibits great learning and exuberant independence; and he is obviously sincere. But we do not feel convinced that he proves all the "disharmonies" he alleges—some of which seem to us, indeed, blessings in disguise; and we do not agree in the least that "religions and systems of philosophy" have as their normal function to act as higher therapeutics for people suffering from appendicitis or abnormal sexuality. Doubtless there are few organisms, if any, which are perfectly adapted even to their natural environment; most, if not all, are only relatively well adapted; and man is no exception. But to exaggerate what Haeckel calls "dys-teleology," as Metchnikoff does, seems to us bad science and worse philosophy, If mankind has ever believed that man's existence was "a kind of bad joke," it has been uncommonly successful in concealing its conclusion; on the contrary, even amid the horrors incident on the progress of civilisation, it has seemed to enjoy the joke hugely, and to take great care to have it continuously repeated.

The third section of Metchnikoff's book is entitled, "What Science can do," and here the brilliant biologist is at his best. His chapters on "Old Age" and on "Death" are most valuable and suggestive contributions to the science and art of life. Any way you take it, our well-being is far from satisfactory; we are beset behind and before with troubles and miseries, vices and crimes, disease and unnatural death. Philosophy may calm our minds and clear our eyes from tears and dyspeptic maculæ; religion may save our souls, if we have any, and rob our premature or unnatural death of its sting; but what of the disharmonies of our protoplasmic constitution, and of those, perhaps intensified, in our children? Science alone can save us, science alone can amend the evolution of the human life, transforming its disharmonies into harmonies (*orthobiosis*). To affect this we must know the human constitution better; we must understand old age, in spite of all the obstacles offered to the study; we must find out why man has almost a monopoly of senility; and we must look death straight in the face till we recognise a friend. This is Metchnikoff's position.

"Luxury ceases to be true happiness as it hinders the making perfect of the normal cycle of human life." Young people must serve an apprenticeship in the art of remaining young, in preparing for physiological old age and natural death. The instinct of natural death may re-emerge from its latent condition when old age has become a normal process. "Conviction that science alone is able to redress the disharmonies of the human constitution will lead directly to the improvement of education and to the solidarity of mankind. . . . In the progress towards the goal, nature will have to be consulted continually. . . . Man must not be content with the gifts of nature; he must direct them by his own efforts." He must practise "eugenics." "To modify the human constitution, it will be necessary first to frame the ideal, and thereafter to set to work with all the resources of science. If there can be formed an ideal able to unite men in a kind of religion of the future, this ideal must be founded on scientific principles. And if it be true, as has been asserted so often, that man can live by faith alone, the faith must be in the power of science."

Metchnikoff's brilliant volume, which we opened with expectation, and which we close with increased expectation, not only affords material to ponder over, but supplies suggestions for useful and much needed action. Many who will disagree with his picture of man's disharmonies (which seems to us exaggerated), and with his estimate of the function of religion and philosophy (which seems to us not only very prejudiced, but is in its main issue mistaken), will sympathise heartily with the third section on "What Science can do." For reasons which cannot be discussed here, we heartily disagree with Metchnikoff's dogmatic conclusion —that "consciousness is a function of special elements in the body that certainly cannot live for ever," and with his estimate of the nature of man (which seems to us to leave the essence of human nature out), and with his depreciation of religion and philosophy (which appears to us just as necessary and natural expressions of man's nature as science is); yet we cannot but admire the genius, and appreciate the utility of this remarkable book.

The Ballachulish Dispute.

THE unfortunate dispute at Ballachulish has ended in a way which justifies the contention upheld in these pages, and espoused unanimously by the medical press of the country. In spite of legal judgments in their favour, the directors and shareholders of the company working the slate quarries have had to bow their heads to the force of public opinion. Having obtained an interdict against Dr. Grant, the directors thought that he and the workmen would tamely submit to their dictation. The company did not count on the loyal support which the workmen have generously and unswervingly extended to their doctor, or on his staunch and courageous stand for what he considered his duty. It is a matter of great satisfaction that justice in this case has triumphed in spite of all the influences arrayed against it. This remark is not intended to convey the impression that a business contract is to be repudiated at the will of either party to the arrangement. Far from it: we would, on general principles, support the binding character of such an agreement. We, nevertheless, assert fearlessly, that if such a contract is terminated in consequence of the unworthy machinations of a hidden conspiracy, and of the underhand conveyance of false accusations, the victim has no recourse save refusal to acquiesce in the termination of the agreement until the matter has been settled by the highest tribunal in the land. Arising apparently, as seems only too clear from statements in the Highland papers, out of a sordid intrigue on the part of a jealous official, anxious to oust a popular doctor, the unfortunate position at Ballachulish left Dr. Grant no alternative but to fight to a finish. The agitation has led to the opening up of many questions regarding the tenure of office of medical practitioners engaged in attendance on industrial associations; to some of these matters we shall direct attention in a future number, and also at the same time once more return to the subject of the terms upon which the parochial medical officers in Scotland hold their appointments. Meantime, we desire to offer our most cordial congratulations to Dr. Grant and to his loyal supporters in their well-won victory over the forces of prejudice, malice, and envy.

ORIGINAL COMMUNICATIONS.

THE CAUSES, PATHOLOGY, AND TREATMENT OF CHRONIC RHEUMATISM.

By RALPH STOCKMAN, M.D., *Professor of Materia Medica and Therapeutics in the University of Glasgow; Physician to the Western Infirmary of Glasgow.*

(PLATES I. AND II.)

Introduction.—Acute rheumatism (rheumatic fever) is an acute microbic infection running a course of variable duration when untreated, and usually presenting certain well-defined symptoms, which render its diagnosis a comparatively easy matter. One attack predisposes to others. Those cases we are accustomed to call "subacute rheumatism" are really milder cases of the same disease, and no hard-and-fast line of distinction can be drawn. A case of acute rheumatism may be unusually prolonged, but never becomes chronic in the true sense of the term. That is to say, it never becomes chronic any more than enteric fever, diphtheria, or measles become chronic. All these diseases may leave sequelæ in the form of bowel lesions, peripheral neuritis, and bronchitis respectively, but such sequelæ are not designated as chronic typhoid fever, chronic diphtheria, or chronic measles. In the same way, acute rheumatism may cause inflammation, followed by fibrous thickening of the valves of the heart, or of the aponeuroses, fasciæ, ligaments, and nerve sheaths, but these are sequelæ or effects of the original disease, and not an indefinite continuation of it. These thickenings of the fibrous tissue give rise to symptoms of pain referred to the muscles, joints, and nerves; but such symptoms or the lesions causing them cannot be properly designated as "chronic rheumatism" in the strict sense, more especially as acute rheumatism is not the only condition which precedes them and is responsible for their presence. Nevertheless, the name "chronic rheumatism" has been so long and so universally applied to chronic painful conditions of the muscles and joints that its retention is now a matter of convenience. In the popular mind, and also to some extent in the medical mind, the name has been long associated, specially and almost exclusively, with affections of the joints, and formerly when so many separate and quite distinct articular lesions were classed together as "rheumatic" this idea was to a large extent justified. Gradually, however, the meaning of the term has become much narrowed by more accurate diagnosis, and we now distinguish rheumatoid arthritis, morbus coxæ senilis, coxa vara, pulmonary osteo-arthropathy, Haygarth's nodosities, septic and gonorrhœal arthritis, and other diseases and affections implicating the joints, as things quite distinct from each other and from chronic rheumatism. It is also very generally recognised that the articular structures proper—bone, synovial membrane and cartilage—are not primarily affected in chronic rheumatism, but that the parts implicated are the fibrous ligaments of the joints, and more especially the aponeuroses and fibrous insertions of the muscles, fasciæ, the periosteum, and the fibrous tissue generally of the muscles, bones, and joints. Any widespread or localised pain or stiffness occurring in these structures, and especially if it recur from time to time, is generally classed as "rheumatic," provided no other definite cause can be assigned. In our systematic treatises the condition is described under the headings "Chronic Rheumatism," "Muscular Rheumatism," "Muscular and Tendinous Rheumatism," "Myalgia," and "Rheumatic Myositis," pain being assigned the most prominent place as a symptom, and damp cold as a cause. Regarding its pathology and essential cause, widely different opinions are expressed, but for the most part without any reasoned criticism or argument. By some authors it is regarded as an attenuated form of acute rheumatism (Pidoux, Bristowe, Maclagan), by others as a neuralgia (Senator, Osler), or a special infection (Strümpell), or a diathesis (Durand-Fardel), or pain from imperfect nutrition (Inman, Anstie). Others regard it as closely connected with gout (Garrod, Hutchinson), and it is often explicitly explained that it occurs quite independently of acute or subacute rheumatism. It is variously stated to have no pathology, to be merely a neuralgia, to depend on active hyperæmia of muscles, or slight inflammatory changes in their fibrous elements, or hyperæmia of the nerve sheaths. A very few authors refer to the presence of definite fibrous thickenings. Its treatment is mentioned in more or less general and vague terms, which are practically identical in all our current text-books, and not much hope of recovery is held out.

Our knowledge of the nature of chronic rheumatism, its causation, and its treatment can scarcely, therefore, be regarded as in anything but a chaotic and unsatisfactory condition. I trust the following systematic summary of many cases which have been treated under the observation of my clinical class in the Western Infirmary and in private practice may help to put matters on a more satisfactory basis.

Pathology.—The essential pathological changes in chronic rheumatism are confined to white fibrous tissue, and as this forms so large a part of the locomotory apparatus of the body, we find accordingly that rheumatism affects specially the aponeuroses, tendons, the sheaths of muscles and nerves, periosteum, fascia, and the fibrous ligamentous structures of the joints. The lesion consists in inflammatory hyperplasia of the connective tissue in patches, most probably the result of the action of toxins conveyed by the blood vessels, and it may be widely spread over the body, or confined to certain areas. The irritant gives rise to proliferation of the fibrous tissue with serous exudation into the inflamed circumscribed parts, which are tender, painful on pressure, and, if large, can be easily felt in the muscles and fasciæ, and on the sternum or other thinly covered bones. At first they may resolve readily enough, leaving no apparent traces behind, but they tend to return on slight provocation, and if much new fibrous tissue forms in the affected area they become permanent, and often increase to a considerable size, or spread out over a large area. The older and more fibrous they become the less tendency they have to disappear spontaneously or on treatment. These indurations assume various forms. Sometimes, especially in the lumbar region or in the fascia lata, large portions of the aponeurosis or subcutaneous fibrous tissue become more or less uniformly thickened, with perhaps more prominent indurations at certain points. In severe cases this gives the skin a hard, inelastic, and brawny feel. More commonly the fibrous indurations are more defined and circumscribed, varying in size from a small-shot or split-pea to an almond, or even half a walnut. The larger ones may be rounded or flattened, the smaller ones often feel like beaded chains along the fibrous edge of a muscle or aponeurosis. Very frequently the thickening takes the form of a strand or cord running through the fascia or subcutaneous fat. Sometimes they are deeply placed in the intermuscular septa, sometimes quite superficially in the subcutaneous tissue, in which case they may adhere to and often slightly pucker the skin. They can often be felt also as small tender projections on the surface of the ribs and other thinly covered bones. When pressed upon they give rise to pain, and if they are vigorously rubbed they swell up in a few hours and become much more painful on pressure. In the same way the fibrous hyperplasia which often results from a sprain, rupture of a muscle, dislocation, or other injury may form a purely local lesion of the same kind, which may give rise to "rheumatic" symptoms. Under the action of certain irritants (cold, damp, meteorological changes, muscular exertion, indigestion, and unknown toxins) these indurations are apt to swell and become tenser, and then they give rise to stiffness, aching, or acute pain. The local tension probably exerts pressure on the filaments of sensory nerves; hence these symptoms. Sudden movement of muscles, by increasing the tension or by exerting pressure on the swollen tissue, often greatly aggravates the pain or causes it to shoot excruciatingly. A branch of a nerve may be pressed upon by a nodule, or may even pass through it, hence the pain often radiates over a wide area perhaps far from the nodule. If muscular movement of the part be kept up, or gentle friction be exercised over the induration, the exudation is temporarily got rid of, the tension is lessened, and the pain and aching generally pass off, usually to return again in two or three hours. One such fibrous nodule in the lumbar region is often enough to cause very obstinate and painful lumbago.

Nerve sheaths are probably affected in the same way. I have never been able to obtain a portion of an affected nerve for histological examination, but clinically it may readily be determined that a superficial nerve, such as the temporal, is very painful on pressure over a limited area during an attack of "rheumatic" neuralgia, while numbness, prickling, and tingling (the results of slight compression) are frequent and recognised manifestations of chronic rheumatism.

The histology of these indurations was studied from a number of them which were excised by my surgical colleague, Dr. J. Crawford Renton, and which were either too acutely painful to be effectively massaged or had not disappeared under prolonged treatment. They include specimens from muscle, from the subcutaneous tissue, and from periosteum. The photographs (Plate I. Figs. 1 and 2) were taken from sections of a small nodular swelling in the buttock. The patient, a man æt. 45, had been subject to muscular rheumatism with occipital and sciatic neuralgia at frequent intervals for ten years, sometimes suffering very severely from exacerbations. The present attack had been brought on by exposure to cold while perspiring freely, and had lasted for three months. He never had any pains in his joints. On examination, a considerable number of small nodules and fibrous thickenings were found in the neck, loins, and buttocks. Many of these were very tender and painful on pressure. The nodule in the right buttock could be very distinctly felt through the skin, and gave the impression of being the size and shape of a small almond. It was very painful, and from it the sciatic pain seemed to dart down the leg. After carefully fixing its position, Dr. Renton cut down upon it, and when exposed it was seen to consist of a swollen and slightly projecting portion of the perimysium of the gluteus medius muscle extending for about half an inch. The swelling with the adjoining portion of muscle was removed, hardened in formol-alcohol, and vertical transverse sections made from it. These show that it is a portion of the fibrous tissue sheath of the muscle, greatly hypertrophied and œdematous, and consisting of white fibrous tissue and an amorphous matrix. At some places the fibrous tissue has penetrated inwards between certain of the muscle fibres, and a few of these have partially degenerated—more likely from the action of a toxin than from pressure. Fibro-blasts are not numerous, and there is no congregation of leucocytes in the neighbourhood of the inflamed area. The small blood vessels show very distinct periarteritis and endarteritis with marked connective tissue proliferation, indicating that they also have suffered from the action of an irritant. The swelling is therefore a chronic, but still comparatively recent, localised inflammation of the perimysium. After its removal the sciatic pain and the aching completely disappeared.

Some of the fibrous nodules lie immediately under the skin, with which they are continuous and to which they may give a puckered appearance. A photograph taken from a section of one of these is shown in Plate I. Fig. 3, the true skin and the dense fibrous tissue of the nodule being continuous with each other. Others lie in the subcutaneous fatty tissue, forming irregularly shaped often branching masses of fibrous tissue, or mere thin strands (Plate I. Fig. 4). They increase in size by the fibro-blasts spreading along the connective tissue of the fat cells (Plate II. Fig. 5).

After being massaged for some time, the serous exudation disappears, the tissue becomes denser and harder, and on being excised the little swelling has the feel and appearance of a piece of hard fibrous tissue, or a thin strand of the same. Plate II. Fig. 6 shows a section of such a nodule; the fibrous tissue is closely packed, the interstices have mostly disappeared, and there is an extraordinary degree of periarteritis and endarteritis, with numerous blood vessels (Plate II. Fig. 7). These hard nodules are sometimes very painful, and if they involve a nerve may cause aching and shooting pains over a wide area. Their excision gives complete relief.

A quite recent example was obtained from a periosteal swelling on the sternum which had all the characters of rheumatic periostitis. It was about half an inch in diameter, slightly raising the surface of the skin, doughy on palpation, and very tender on even slight pressure. It was incised and a small portion removed. The incision relieved the tension and lessened the pain. The patient, a man æt. 35, had been ill for about eight weeks with severe muscular pains and slight arthritis. The swelling on the sternum had been there for three weeks or less, and many tender painful nodules were found in the loins and elsewhere. Microscopical examination showed that the swelling consisted of proliferating fibrous tissue, œdematous, and containing a good many fibro-blasts, numerous blood vessels, and many newly formed or forming capillaries. At some parts the fibrous tissue was older and denser than at others. There was an entire absence of any local leucocytic reaction, and the connective tissue in the walls of the blood vessels was greatly increased in amount. I was unable to detect any micro-organisms in the tissue, but the staining methods may not have been suitable. The irritation must be due either to a toxin, or to a small local invasion of microbes.

Note.—It has long been recognised (Balfour, Scudamore, Fuller, Durand-Fardel) that chronic rheumatism is not an arthritis, but an affection of the great fibrous tissue structures of the muscles, bones, and joints. Changes do not occur in the articular cartilages, nor in the bones, except secondarily. Virchow and others have described the condition as it affects the fibrous tissue of muscles, but they mostly examined muscles in which the fibrous changes were much more advanced than in ordinary clinical cases.

So far as I am aware, the presence of definite fibrous thickenings in chronic rheumatism was first mentioned by Dr. William Balfour (1816). He wrote a book on the subject, in which he describes several of his patients as having a large number of nodular tumours and thickenings which were painful to the touch, and from which pains shot to neighbouring parts. In one case he observes that "the fascia of the muscles and sheaths of the tendons were thickened, knotty, and puffy," and that the origins and insertions of many muscles were painful. He recognised the importance of these fibrous tissue growths as the cause of chronic rheumatism, and his whole treatment was directed to getting rid of them. His work has been practically forgotten. Scudamore (1827) was also well aware of the fibrous tissue changes in chronic rheumatism. He describes them as follows:—"Bursæ enlarged, thickened, and hardened, tendinous sheaths distended and thickened, and the tendons knotty at their insertions and often contracted, the aponeuroses thickened, and muscles which seem like a mass of ligament." In a case reported on page 406 of his book he describes numerous small tumours as being present in the fascia lata of each thigh, and he often mentions periosteal nodes. Later, Froriep (1843) laid great stress on these indurations (which he called *rheumatische Schwiele*), and described them in detail as occurring in the connective tissue of the skin, aponeuroses, and periosteum. He says that out of one hundred and fifty cases of chronic rheumatism he failed only twice to find them. Since his time Berghman, Helleday, Ewer, Hackenbruch, and Strauss have specially drawn attention to the importance of these fibrous tissue swellings as the cause of chronic rheumatic pain. Judging from the almost entire absence of recent writings on the subject in this country, their importance and frequency have not been widely recognised. Cases of the occurrence of "rheumatic nodules" in adults have been reported by Mahomed, Duckworth, Fowler, and Middleton, but more as curiosities than as a matter of very wide and general interest.

Etiology.—In discussing the etiology of chronic rheumatism it is necessary to differentiate between—(1) The original causes of the local fibrous thickenings and nodules, and (2) the causes of the subsequent rheumatic attacks, when the fibrous indurations have become fully established, and the individual is subject to frequent and recurrent "muscular rheumatism" (chronic rheumatism), or to persistent "rheumatic" neuralgia.

I. ORIGINAL CAUSES.—Of these acute rheumatism is certainly one. The ephemeral nodules seen in children are well known since Barlow and Warner described them in 1881, but both in children and in adults permanent fibrous indurations often remain as the result of acute rheumatism. These fibrous changes may be slight and widespread, not capable of being felt by palpation, and giving rise merely to slight stiffness in the muscles and joints, or they may be felt as small tender thickenings on the aponeuroses, tendons, and ligaments, which are often persistently aching and painful. They ache with changes of weather, and often persist for months or permanently. Peripheral neuritis, with pain, numbness, paralysis, paresis, and wasting of muscles, may also occur after acute rheumatism, and, as previously observed, is probably a result of thickening of the fibrous nerve sheath. These are affections or sequelæ resulting from acute rheumatism; they are probably due to the action of toxins on the fibrous tissue, or may possibly be the result of damage produced by the actual presence of the causal micro-organisms, and they differ entirely from the original disease in their nature and in the treatment required to cure them. Scudamore says: "The acute rheumatism very commonly produces a troublesome sequence of stiffness, debility, and aching of the limbs, most felt in the morning and at night, for which exercise and frictions should be used." Fuller also lays stress on this: "After the acute or subacute symptoms have passed, tenderness and aching remain in ligaments, tendons, fasciæ, and aponeurotic sheaths. They are thickened, stiff, and inapt for motion."

I have often observed the formation of these indurations in adults during acute rheumatism, the following case being a fairly typical example. During an attack of acute rheumatism, and when the temperature and pulse had returned to normal conditions, the patient, a young man, æt. 24, still complained of severe pain and aching in various parts of his body on exposure to draughts, or during damp weather, or without any apparent cause. There was great tenderness at the sternal part of the first and second intercostal spaces, on the outer condyle of one humerus, on the ligamentum patellæ, over the instep, and elsewhere. No distinct indurations could be felt in these places, but they were slightly doughy and very painful to touch, and ached as above described. There was pain over the upper sternum on respiration. Several very painful nodules were present in both calves and on certain of the ribs. There was grating in the palm of the hand from tendo-synovitis. His back muscles were very stiff, but no distinct indurations could be made out. On some days he was nearly free from pain, on others he suffered severely, and improvement under treatment was very tedious.

Slight febrile attacks with pain and aching in the muscles and bones, often described as an "influenza cold" or a "rheumatic cold," also cause these fibrous thickenings. Leube thinks it is a specific infection, and possibly an attenuated form of the rheumatic virus. Dr. Newton, in reporting an epidemic of forty-three cases of "acute muscular rheumatism" which occurred in his practice, expresses the opinion that it is identical with acute articular rheumatism. Repeated attacks of these "muscular colds," whatever their true nature may be, bring on chronic rheumatism in time.

True influenza is often followed by these fibrous thickenings, and sometimes in a very severe and widespread form. They are probably sequelæ of the changes causing the aches and pains in the bones and muscles, which are prominent symptoms in certain cases of influenza, and which are almost certainly due to local irritation of fibrous tissue by the toxin or microbe of the disease.

Pitt states that fibrous nodules occur also with osteo-arthritis, and I have seen them in one early case of rheumatoid arthritis. They are said to come on after scarlatinal rheumatism, but I cannot confirm this from my own observation. I have, however, seen them after gonorrhœal inflammation of joints and of the plantar and lumbar fasciæ.

Persons who are subject to repeated attacks of sore throat often suffer from chronic muscular rheumatism, and in this case the irritating agent may be a toxin absorbed from the tonsil or pharynx.

It is true, however, that persons who say they have never suffered from acute rheumatism, muscular colds, influenza, or sore throat, are sometimes martyrs to chronic rheumatism, and have fibrous indurations. These come on insidiously, and are only noticed when they begin to give trouble. In some patients no other cause can be assigned than a history of frequent exposure to cold and wet, or to extremes of heat and cold, accompanied often by hard muscular work. Such a person complains that he is gradually getting stiffer than he used to be, and in time chronic rheumatism develops. Possibly in some cases irritating toxins absorbed from the bowel may act as the cause. I do not think, however, that muscular rheumatism has any relationship to gout, or that it can be brought on by any particular errors of diet.

Symptoms closely resembling rheumatism occur in lead poisoning (apart from gout), and here there is increase of the connective tissue of the muscles and nerve sheaths, which probably accounts for the cramp-like and neuralgic pains.

Local injuries, as previously explained, may result in fibrous hyperplasia, and in the case of a joint, or an important aponeurosis or tendon, this may give rise to severe local rheumatism and varying degrees of disablement. Frequent slight traumata from over-exertion (as in athletes, gymnasts, labourers) may have the same effect. At least these people tend to suffer from chronic rheumatism, and I have been often unable to find any other cause for it than their occupations.

With regard to the part which age plays in the etiology, chronic rheumatism is said to be a disease of maturer years; but this is hardly correct. A slight degree of it constitutes the "stiffness of age," but it is not a necessary concomitant of advancing years. It is very common in adolescents and in early middle life.

Chronic rheumatism therefore is not a diathesis. It is a local affection of the fibrous tissues, and results from several preceding causes.

II. THE CAUSES OF PAIN AND ACHING AFTER THE FIBROUS INDURATIONS HAVE BECOME FULLY ESTABLISHED.—In discussing the pathology of chronic rheumatism, it has been already explained that the immediate cause of the pain and aching is swelling and tension of the fibrous indurations. The exciting causes are very evident, and are well known to all sufferers from the affection.

Weather conditions: Cold, damp.—Various meteorological conditions, damp or cold weather, lying or sitting on damp ground or on a cold seat, exposure to draughts, wet clothes, usually bring on an acute exacerbation, which may be repeated before the previous one has quite passed off, and in this way the patient may be seldom free from aching pains. The greater part of the body may be affected, or only the part which may have been specially exposed (lumbago, pleurodynia, stiff-neck, and so on). If the person is in vigorous health, in the open air, and indulging in active exercise, frequently no evil effects follow a wetting, but one can never count on this. The rheumatic pains are most apt to ensue when leading a sedentary town life, and often on very slight exposure. The approach of rain, sudden changes in the weather, and east winds, also cause aching and pain. It is very difficult to explain the action of these different meteorological conditions. Longstreth says that the painful symptoms do not correspond to rain, but rather to a lowering of barometric pressure. A rapidly rising barometer is also, he says, accompanied by pain. Patients have often told me that when rain actually commences, their pains lessen, and that they can tell its approach even when in bed, so that it is not a question of exposure. It is a matter of popular knowledge that old injuries, wounds, and corns ache with changes of weather; and Weir Mitchell has found, from careful inquiries in fifty cases of old amputations, that more than half of them could foretell a change from dry to wet, or from wet to dry, or a change of wind, from the painful sensations in their stumps. Possibly the atmospheric changes may increase or lessen the lymph pressure in the body, and so increase or lessen the tension in the new fibrous tissues. I am unable to suggest any more definite explanation, but we may remember that many plants and many domestic and wild animals show plainly by their behaviour that they are conscious of impending weather changes long before these actually occur, and in the case of plants at least this must be due to some influence exerted on the cell contents, and not to the memory of previous experiences.

Unusual or violent muscular exertion.—Chronic rheumatics are often very unwilling to take moderately violent exercise, owing to the prolonged stiffness and aching which usually follow it. A single severe wrench sometimes starts aching in a nodule or strand, and this may go on for weeks. It is apparently due to local causes, for riding brings on aching in the thighs, bicycling in the lower extremities, golfing in the arms and back, leaving in each case the other parts comparatively free. The pain can often be located in a particular induration or in more than one, to which it may return again and again; sometimes, however, it is more diffuse, and radiates.

Disordered primæ viæ.—An acute indigestion brought on by a big dinner with mixed wines often starts more or less prolonged aching in certain of the fibrous tissues (lumbago, joints, etc.). The champagne and port are often specially blamed, and the aching is attributed by doctor and patient alike to gout. The real cause is probably intestinal fermentation with absorption of an irritating toxin which specially affects the fibrous indurations. It results from over-indulgence in rich food and a consequent indigestion, rather than from any special article, and this is shown by the fact that if such a dinner is well digested and agrees well, no aching follows on it.

Chronic intestinal indigestion has a similar effect. The tongue may be clean and the appetite good, but there is flatulence, a constant tendency to slight or severe headache, and very often temporal neuralgia. As long as these symptoms last, the fibrous indurations tend to ache. Scudamore drew special attention to disordered bowel as a cause of rheumatic pain, and treated such patients with mercurial purges.

Pharyngitis, etc.—An attack of pharyngitis, or an "influenza cold," also cause all the indurations throughout the body to ache, and are common causes of acute exacerbations.

These are, in my experience, the most frequent and obvious causes of pain and aching in chronic rheumatics, but no doubt there are others.

(*To be continued.*)

DESCRIPTION OF PLATES I. AND II.

FIG. 1.—Section of inflamed perimysium forming a painful swelling on the muscle (× 140). It consists of proliferated and œdematous fibrous tissue with an amorphous matrix, and at places this penetrated between the muscle fibres. In the section it is detached from the underlying muscle fibres.

FIG. 2.—Portion of same (× 550).

FIG. 3.—Section of fibrous nodule lying immediately under the skin and continuous with it (× 75). It had been massaged for some time.

FIG. 4.—A strand of fibrous tissue lying in the subcutaneous fat, and spreading into it (× 75). This was painful on pressure.

FIG. 5.—Section of dense subcutaneous nodule spreading into the fatty tissue (× 75).

FIG. 6.—Section of a nodule which lay in the fascia (× 140). It had been massaged, but instead of dispersing became very hard and fibrous.

FIG. 7.—Section of portion of a nodule showing periarteritis and endarteritis and numerous blood vessels (× 75). The nodule had been massaged for some time.

FIG. 8.—Section of recent periosteal nodule (× 140). It shows the increased and œdematous fibrous tissue.

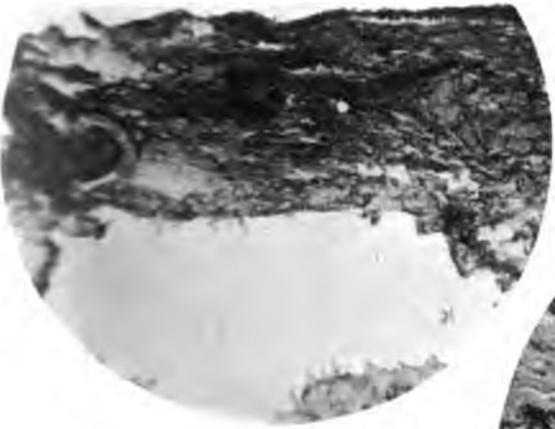


FIG. 1.

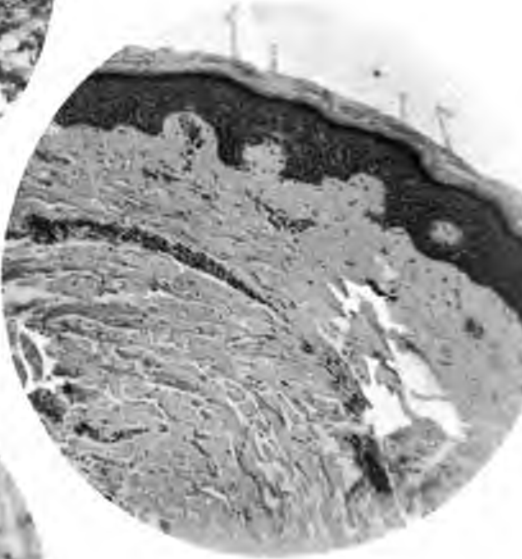


FIG. 3.

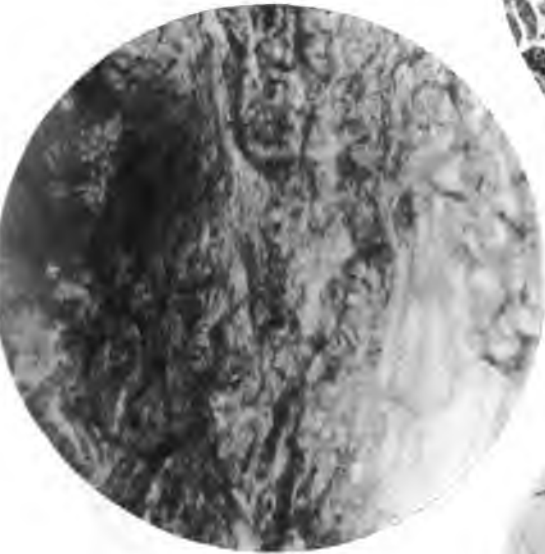


FIG. 2.

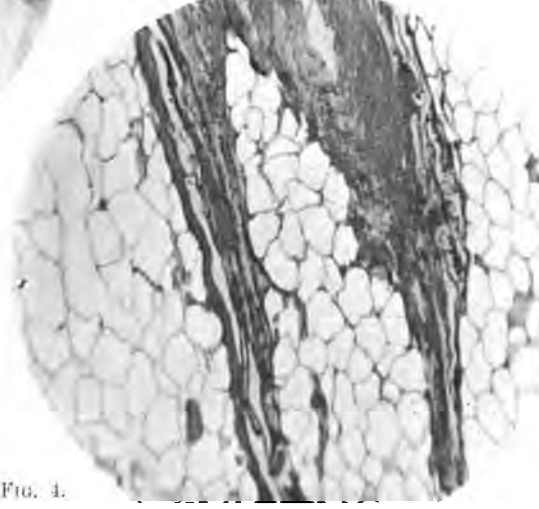


FIG. 4.

ON THE ETIOLOGY OF FIBRINOUS BRONCHITIS.[1]

By W. T. Ritchie, M.D., F.R.C.P.Ed., *Clinical Medicine Tutor, Royal Infirmary, Edinburgh ; Pathologist, Leith Hospital.*

(Plate III.)

There are three main varieties of bronchial casts—*First,* those in which the false membranes are caused by the *Bacillus diphtheriæ. Secondly,* fibrinous casts of the smaller bronchi, such as are found in the expectoration in a certain proportion of cases of acute lobar pneumonia. *Thirdly,* there are the casts expectorated in essential fibrinous bronchitis, which is either an acute, or more frequently a chronic disease of infrequent occurrence.

The clinical features of essential fibrinous bronchitis, or, as it is usually termed, fibrinous or plastic bronchitis, have long since been recognised and carefully studied. The disease is recorded in association with, or as a sequel of, smoke inhalation, pulmonary tuberculosis, cardiac disease, measles, pemphigus, erysipelas, and various other local and general diseases.

The bacteriological aspects of fibrinous bronchitis have, however, been very imperfectly studied. In 1885, Jaccoud (1) found pneumococci, and in 1887 the same cocci were seen in bronchial casts by Regard (2), but the diagnosis was not confirmed by cultures. From bronchial casts Picchini (3) cultivated three different microorganisms, which, after injection into the trachea of rabbits, is said to have caused fibrino-hæmorrhagic bronchitis. It is much to be regretted that the characters of the bacteria obtained by Picchini were not fully described. R. Koch (4), examining sections of a cast, found bacteria which retained Gram's stain, but they were always enclosed in mucus, and he did not consider them to be etiologically important. No pneumococci or tubercle bacilli were detected. Magniaux (5) examined a case, a boy, æt. 11, who subsequently died of tuberculous meningitis, and states that *B. pneumoniæ* of Friedländer could be obtained from the bronchial pseudo-membranes. These bacilli were abundant, and were found in pure culture. Friedländer's bacillus was also cultivated from the blood, *intra vitum.* Sokolowski (6) gives notes regarding the bacteriologic examination of three out of the four cases he records. In his second case he obtained cultures of *Staphylococcus pyogenes albus* and *aureus* from the sputum,—a fact which has, of course, no bearing whatever on the pathology of the disease. In Sokolowski's third case he again found *Staphylococcus pyogenes albus* in the sputum, whereas in sections of the casts, which consisted mainly of leucocytes, mucus, and epithelial cells, and contained but little fibrin, he detected cocci in groups resembling staphylococci, fewer streptococci with eight or more cocci in a chain, coccci in groups of four, like *Micrococcus tetragenus*, and lastly, very scanty bacilli, which were moderately thick and had rounded ends. In Sokolowski's fourth case the superficial layers of the cast, which consisted mainly of fibrin, contained cocci, isolated or in groups, and some of the cocci possessed a definite capsule. Nachod (7) in one instance found *Staphylococcus pyogenes albus* in pure culture in the interior of the cast.

---

[1] From the Research Laboratory, Royal College of Physicians of Edinburgh.

Streptococci have also been found. Huchard (8) found that a muco-membranous cast contained *Staphylococcus albus* and a bacillus the characters of which are not described. No pneumococci or tubercle bacilli were detected; but Claisse (9), after careful bacteriological study of the casts from the same case, concludes that the disease was due to chronic streptococcal infection; staphylococci and various bacilli were detected on the outer surface of the casts, but the streptococci alone were found in the interior. Souques (10) demonstrated streptococci, pneumococci, and staphylococci in the casts. Schittenhelm (11) states that in the larger and smaller bronchi of his case there was a streptococcus with typical chains. The cocci were abundant on the surface and in the outer layers of the fibrinous casts, but could not be seen in the central parts of the casts. Cultures from the sputum gave growths of streptococci and staphylococci, the latter being regarded as contaminations from the mouth or upper part of the respiratory tract. All attempts to detect diphtheria bacilli and pneumococci gave negative results. In fresh preparations from a mucous cast, Hochhaus (12) found a few streptococci, whereas, in the hardened preparations no tubercle bacilli, pneumococci, or diphtheria bacilli could be found. Bettmann (13) has recorded two cases. In his first case, the casts, which consisted partly of fibrin and partly of mucus, contained streptococci and staphylococci, which were generally adhering to the outer sides of the cast, though a very few cocci were occasionally found in the mucus within the cast. Cultures were made from the interior of the main branch of the largest cast, and *Streptococcus pyogenes* and *Staphylococcus aureus* were obtained in pure culture. No diphtheria bacilli or pneumococci were cultivated. In Bettmann's second case there were numerous streptococci and staphyloccoci in the casts, which were small, and consisted for the most part of fibrin.

The diplococci seen by Jaccoud (1) and Regard (2) within the bronchial casts were said to be pneumococci. In a mucous cast A. Klein (14) detected diplococci. Landrieux and Triboulet (15) found Gram positive diplococci, considered to be pneumococci, in the interior of the cast on section. On the outer margin of the cast there were several varieties of bacteria. No cultures were made. The most important causal micro-organism is considered by Hoffmann (16) to be the pneumococcus. In a former paper (17), it has been shown that ordinary purulent bronchitis may be due to the pneumococcus alone, and consequently we cannot accept Hoffmann's theory that fibrinous bronchitis is induced when the pneumococcus is the sole or the chief causal bacterium, whereas ordinary catarrhal bronchitis is due to streptococci, or some other cocci than pneumococci. Strauss (18), in sections of a fibrinous cast, found diplococci like pneumococci; and Ott (19), in the casts from a case of chronic fibrinous bronchitis, found pneumococci and staphylococci.

Lichtenstein and v. Leyden (20) record a case in which acid- but not alcohol-proof bacilli were found along with cocci in the sputum; but in the fibrinous casts these bacilli could not be detected. Fritzsche (21), and likewise Heubner (22), found that bacteriological examination shed no light on the etiology of their cases. Cæsaris-Demel (23) concludes that the bacteria found in the bronchial contents may be merely accidental; and lastly, Kerschensteiner (24) records one case. In films from and sections of the casts he found no bacteria; from unwashed casts he cultivated *B. fluorescens liquefaciens*, streptococci, and a bacillus like *B. coli commune*, which may be all regarded as contaminations, as the casts were not washed before examination.

Bacteriological examination of the casts thus shows not only that fibrinous bronchitis is not induced by a specific virus, but that one may expect to find the same bacteria—and especially pneumococci, streptococci, and staphylococci — as in ordinary purulent bronchitis.

I have recently had the opportunity of examining three arborescent bronchial casts expectorated by a patient suffering from chronic fibrinous bronchitis. The case was under the care of Dr. George A. Gibson, whom I desire to thank for having placed the casts at my disposal. The first specimen, a cast of the smaller bronchi, was obtained in a bottle of sterile water on the 23rd October 1903, and was a portion of a large arborescent cast, similar to the second and third casts described in the latter part of this paper. Blood-serum slope, hydrocele-fluid agar, and deep glucose agar media were inoculated with a small portion of the cast after it had been repeatedly and thoroughly washed in sterile saline solution. All three media gave an abundant growth of *B. pneumoniæ* (Friedländer), and of *B. coli commune*, the characters of which are given in the table on pp. 120, 121. A grey mouse was inoculated subcutaneously with 5 minims of a twenty-four hours old bouillon subculture of the *B. pneumoniæ*. No local reaction followed the injection, and the mouse was alive and well seven days later. A second mouse was inoculated intraperitoneally with 1 c.c. of the same culture. Nineteen hours later the mouse was observed to be dying. It was accordingly killed by administration of chloroform, and an examination was immediately made. The purulent peritoneal effusion contained abundant bacilli identical with the *B. pneumoniæ* which had been

[*Continued on page* 122.

TABLE.—

Form.	Motility.	Staining.	Gelatine Plate.	Gelatine Stab.	Agar Plate.
Bacillus pneumoniæ,					
Short straight bacilli, with rounded ends. No spores.	Non-motile.	Gram negative.	Superficial colonies, circular, cream-coloured, convex, and moist; diameter after five days, 2·2 mm. Deep colonies, brown and whetstone-shaped. No liquefaction.	Typical nail culture. No liquefaction.	Superficial colonies are circular, cream-coloured, convex, and moist.
Bacillus pneumoniæ,					
,,	,,	,,	Superficial colonies, circular, creamy-white, convex, moist; diameter after five days, 1·5 mm. Deep colonies, circular, and pale brown. No liquefaction.	Nail culture. No liquefaction.	Superficial colonies are circular, greyish-white, and elevated.
Bacillus pneumoniæ,					
,,	,,	,,	Superficial colonies, pale whitish tint, elevated. Deep colonies, oval, and dark brown. No liquefaction.	Nail culture not very pronounced. No liquefaction.	,,
Bacterium coli commune,					
,,	Actively motile.	,,	Superficial colonies, flat, greyish, with wavy indentations at margin. No liquefaction.	Greyish growth along needle track; flat, greyish surface growth with wavy margin. No liquefaction.	Flat, almost colourless colonies of large size.
Proteus vulgaris,					
,,	Motile.	,,	On second day the margins of the superficial colonies present branching offshoots, and liquefaction has commenced.	Greyish growth along needle track. Liquefaction begins on second day.	Superficial colonies are flat, faintly white, 1–1·5 mm. in diameter, margin sharp and circular.

Blood Serum Slope.	Bouillon.	Milk.	Reaction of Fluid Cultures to Litmus.	Gas Formation.	Potato.	Indol Production in Peptone Water.
from First Cast.						
Thick, moist, whitish growth. No liquefaction.	Diffuse turbidity with surface pellicle. Later, a stringy white deposit.	Coagulated in four days. No subsequent liquefaction of the clot.	Acid.	From glucose and maltose, but not from lactose.	Thick, elevated, cream-coloured growth.	None, in culture four days old.
from Interior of Second Cast.						
Somewhat elevated, whitish, moist growth. No liquefaction.	,,	Not coagulated after ten days.	Alkaline, but acid to phenolphthalein.	No gas formed from glucose, maltose, or lactose.	Elevated, yellowish-white growth.	,,
from Exterior of Second Cast.						
,,	,,	Coagulated on third day. No subsequent liquefaction of the clot.	Acid.	Gas formed from glucose, maltose, and lactose.	Thick, elevated, cream-coloured growth, with small bubbles of gas on the surface.	Indol reaction on fifth day.
from First Cast.						
Thin, whitish-grey, moist growth. No liquefaction.	Diffuse turbidity. No surface pellicle.	,,	,,	Gas formed from glucose and maltose, but not from lactose.	Thin, almost colourless growth.	Indol reaction on fourth day.
from Exterior of Second Cast.						
Thin, almost colourless growth.	,,	Coagulated on fourth day. Liquefaction of clot begins on tenth day, and is complete on fifteenth day; have then yellowish alkaline fluid.	Alkaline.	No gas formed from glucose, maltose, or lactose.	Orange-coloured growth.	None, in culture four days old.

injected, and the same micro-organism was recovered in pure culture from the heart blood. I would express my obligation to Dr. Noël Paton for the inoculation of the mice.

A second cast was obtained in sterile water on the 28th October. The length of the cast was 16·5 cm. The diameter of the main, almost cylindrical, trunk just before its bifurcation was 1·2 cm., and as the diameter of the left main bronchus varies beween 0·68 and 0·36 of an inch, and that of the right between 0·81 and 0·48 of an inch, the main trunk of the cast had probably originated in a secondary bronchus. The cast (Plate III. Fig. 1) was of a milk-white colour, and presented dichotomous branchings which diminished in length and thickness to the ninth degree. Small lateral branches were occasionally given off from a larger stem, and in one instance three branches of equal size arose together. Some of the terminal branches were of well-marked spiral form. The cast floated in water, was markedly elastic, and of neutral reaction to litmus. Transverse sections of both the larger and smaller branches presented to the naked eye a stratified or laminated appearance, but in no part of the cast was there a visible lumen. The surface of the main trunk and larger branches was somewhat uneven, indicating possibly that small air bubbles were contained within the cast. After the cast had been repeatedly washed in sterile saline solution, the surface of one of the first branches was seared with a red-hot platinum spatula, the seared surface was incised with a sterilised knife, and films and cultures were then made from the interior of the cast. The films presented numerous straight extracellular Gram negative bacilli, usually end-to-end in pairs like *B. pneumoniæ.* No other bacteria could be detected. The inoculated agar medium showed a pure culture of a bacillus which closely resembled certain strains of *B. pnuemoniæ.* Its characters, given in the table on pp. 120, 121, showed that it was not in all respects identical with the *B. pneumoniæ* from the first cast, and seven days after the intraperitoneal inoculation of a grey mouse, with 1 c.c. of a twenty-four hours old bouillon culture, the mouse was alive and well. For the performance of this inoculation I am again indebted to Dr. Noël Paton. A portion of a smaller branch was inoculated on to agar, hydrocele-fluid agar and blood agar media. The only bacteria obtained were a *B. pneumoniæ* and *Proteus vulgaris.* Both were present in large numbers.

A third cast, reproduced, half the natural size, in Plate III. Fig. 2, was expectorated by the same patient, and obtained on the 6th November. This cast possessed the same characters as the second cast, and the spiral form of some of the terminal branches was very pronounced. The total length of this cast was 15·5 cms., and the diameter of the main trunk was 1·2 cm., being thus the same as the second cast. Films and cultures were made from the interior, the same precautions having been taken as in the case of the second cast. The films were found to contain abundant lancet-shaped extracellular Gram positive diplococci, surrounded by a capsule which stained by Richard Muir's method, but there were no other bacteria. The media gave an abundant and pure culture of *Diplococcus pneumoniæ*, the diagnosis being confirmed by bouillon and gelatin-stab subcultures. In none of the three casts could any acid-proof bacilli, diphtheria bacilli, or staphylococci be detected.

The association of *B. pneumoniæ* with *B. coli commune* on the exterior aspect of the first cast, and with *Proteus vulgaris* on that of the second, probably indicates contamination of the casts either during or subsequent to their passage through the pharynx and mouth, and consequently we cannot claim that the bacillus pneumoniæ had a causal relationship to the disease. Moreover, the *B. pneumoniæ* of the first cast was not identical with the bacillus found *within* the second cast, nor was it found in the third cast. The *B. pneumoniæ* contained within the second cast was a different strain from that which was found on the exterior of the cast, and therefore was not the result of mouth contamination. It was possibly a secondary micro-organism. The pneumococcus was evidently the virus which induced the formation of the third cast, and even though this coccus was not found in the first two casts, to it we may ascribe the chief etiological significance, and may consider the bronchitis as due to pneumococcal infection. We may note that, so far as can be ascertained, pneumococci have been hitherto definitely detected in only five cases, whilst Ott (19) is the only observer who has previously confirmed by cultures the diagnosis of pneumococcal infection, and in his case this coccus was associated with staphylococci, so that its etiological significance was less definite than in the present instance.

Chemical and histological characters of the casts.—Portions of the second cast were tested, and found to be dissolved by artificial gastric digestion, but to be insoluble in water, normal sodium carbonate solution, saturated solution of lime water, decinormal sulphuric acid solution, or alcohol. After portions of the cast had lain for twenty-four hours in the sodium carbonate solution and lime water, the solutions were tested with acetic acid, and no mucin reaction obtained. Portions of the first and second casts were fixed in alcohol and in mercuric chloride, and subsequently embedded and cut in paraffin. In sections stained with hæmatoxylin and eosin the casts, though somewhat shrunken, were seen (Fig. 3) to present the typical appearance, namely, of concentric laminæ. The peripheral laminæ encircled others which were somewhat irregular, convoluted, or formed smaller circles. The laminæ themselves were seen to consist of fine fibrils, and isolated fine fibrils were also seen running between and sometimes forming a network between the laminæ. In sections stained with hæmatoxylin and eosin, or methylene-blue and eosin, the fibrils were stained pink; they were of a yellowish tint when stained by Van Gieson's stain, and retained Weigert's stain. These facts, together with the chemical tests already detailed, indicate that the main element in the composition of the casts was fibrin and not mucus. This fact is important, because, although bronchial casts are generally of fibrinous nature, yet Beschorner (25), Grandy (26), Klein (27), Habel (28), and Hochhaus (12) have reported cases in which the casts consisted for the most part of mucus. Between the laminæ there were numerous leucocytes. In conformity with the observations of Herzog (29), Bettman (13), and others, the great majority of the leucocytes were mononuclears (Fig. 4), polymorphonuclears were scanty, and eosinophile cells were not abundant, not more than four or five being on the average found in each section. No definite alveolar epithelium, and no bronchial epithelium or red-blood corpuscles, could be detected either in, or adhering to the outer surface of, the casts.

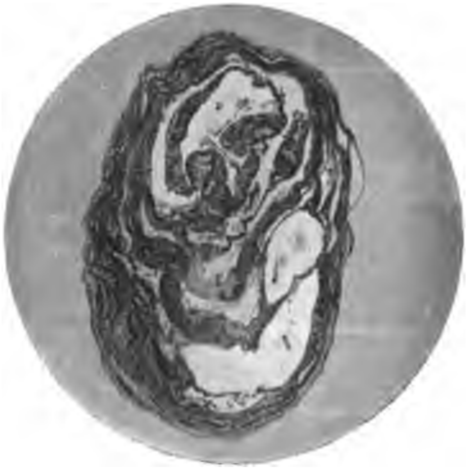


FIG. 3.—Transverse section of a branch of the second cast. (Magnified 14 diameters.)

The spiral form of the fine terminal branches of bronchial casts has suggested to previous observers that, from the pathological standpoint, there may be a close relationship between fibrinous bronchitis and bronchial asthma. This relationship is also suggested by the fact that Curschmann's spirals, Charcot-Leyden crystals, and eosinophile cells may be found in the sputum of fibrinous bronchitis, that the central thread of a Curschmann's spiral has been shown by Adolf Schmidt to consist of fibrin, and that small fibrinous casts have been detected in the expectoration of asthmatics. There is thus considerable evidence in favour of the view that bronchial asthma is due to a fibrinous inflammation of the smaller bronchi or bronchioles, and that observers such as Berkart (30), and Gee (31) are justified in assuming that the bronchial spasm is due to obstruction within the bronchial lumen, or even that the hypothesis of bronchial spasm is an unnecessary explanation of the asthmatic attack. A. Fränkel's (32) recent researches tend to confirm the relationship of these two diseases. He considers that in asthma, fibrinous bronchitis, and obliterative fibrous bronchiolitis, we have to deal with a morbid affection of the bronchial mucous membrane differing merely in the degree of its intensity. In bronchial asthma there is a simple yet abundant catarrhal desquamation much in excess of that which occurs in acute or chronic bronchitis of the ordinary purulent variety. In fibrinous bronchitis there is more or less permanent loss of bronchial epithelium, in consequence of which there is fibrin formation in the bronchial lumen; and lastly, in obliterative fibrous bronchitis, as described by Lange (33) and Fränkel, there is necrosis of the bronchiole epithelium and subjacent superficial layer of the mucous membrane, followed by an endo-bronchial overgrowth of connective tissue, such as may occur as a sequel of acute lobar pneumonia. Fränkel points out that for the production of a fibrinous cast the denuding of the bronchial mucous membrane of its epithelium need not be very extensive. A merely localised change of this nature, provided it be more or less lasting, may be followed by a copious pouring out into the bronchi of coagulable fluid, which, filling a certain number of bronchi, coagulates and forms a fibrinous cast. This theory of Fränkel's as to the mode of production of bronchial casts is, however, inapplic-

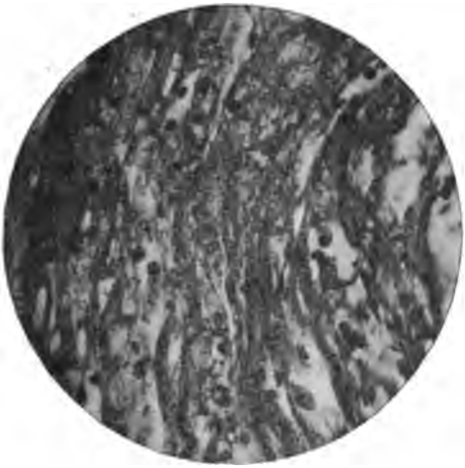


FIG. 4.—High, power view of transverse section of a branch of the second cast.

able in those cases in which the cast consists of mucus. In such cases, Habel ([28]) supposes that the secreted mucus is coagulated because of the presence of acid forming bacteria in the bronchi. This theory, however, has not yet been verified.

Conclusions.—In the case now recorded, the special points of interest are the evidence pointing to the disease being the result of pneumococcal infection, the large size of the expectorated casts, their fibrinous nature, the spiral terminal branches, the large number of mononuclear, and the scanty number of polymorphonuclear and eosinophile leucocytes in the casts, and the absence of red-blood corpuscles, and of alveolar and bronchial epithelium, either within or on the outer surface of the casts.

BIBLIOGRAPHY.

1. Jaccoud.—Quoted by Lépine, *Gaz. hebd. de méd.*, Paris, 1897, N. S., tome ii. p. 1225. 2. Regard.—"Contrib. à l'étude de la Bronchite Fibrineuse." Disst. Inaug., Berne, 1887. 3. Picchini.—*Arch. ital. di clin. med.* Milan, 1889, tome i. p. 105. 4. R. Koch.—*St. Petersb. med. Wchnschr.*, 1892, Bd. xvii. S. 83. 5. Magniaux.—Thèse de Paris, 1895. 6. Sokolowski.—*Deutsches Arch. f. klin. Med.*, Leipzig, 1896, Bd. lvi. S. 476. 7. Nachod.—*Prag. med. Wchnschr.*, 1897, Bd. xxii. S. 25, 50, 62. 8. Huchard.—*Journ. des Pract.*, 1895, tome xi. p. 117. 9. Claisse.—*Compt. rend. Soc. de biol.*, Paris, 1896, tome iii. dixième série, p. 378. 10. Souques.—Quoted by Bettmann. 11. Schittenhelm.—*Deutsches Arch. f. klin. Med.*, Leipzig, 1900, Bd. lxvii. S. 336. 12. Hochhaus.—*Ibid.*, 1902, Bd. lxxiv. S. 11. 13. Bettmann.—*Am. Journ. Med. Sc.*, Phila., 1902, vol. cxxiii. p. 304. 14. A. Klein.—*Wien. klin. Wchnschr.*, 1896, Bd. ix. S. 701. 15. Landrieux et Triboulet.—*Journ. des Pract.*, 1896, tome x. p. 97. 16. Hoffmann.—"Die Krankh. d. Bronchien." "Nothnagel's spec. Path., 1896, Bd. xiii. S. 70." 17. Ritchie.—*Journ. Path. and Bacteriol.*, Edin. and London, 1901, vol. vii. p. 1. 18. Strauss.—*Berl. klin. Wchnschr.*, 1900, Bd. xxxvii. S. 407. 19. Ott.—*München. med. Wchnschr.*, 1900, Bd. xlvii. S. 965. 20. Lichtenstein, v. Leyden.—*Deutsche med. Wchnschr.*, Leipzig, Vereins-Beil., 1902, Bd. xxviii. S. 97; also Lichtenstein.—*Ztschr. f. Tuberk. u. Heilstaltenw.*, Leipzig, 1902, Bd. iii. S. 193. 21. Fritzsche.—*Schmidt's Jahrb.*, Leipzig, 1893, Bd. ccxxxvii. S. 219. 22. Heubner.—*Ibid.*, S. 220. 23. Cæsaris-Demel.—*Gior. d. r. Accad. di med. di Torino*, 1900, tome lxiii. p. 577. 24. Kerschensteiner.—*Deutsches Arch. f. klin. Med.*, Leipzig, 1903, Bd. lxxv. S. 132, 441. 25. Beschorner.—*Samml. klin. Vortr.*, Leipzig, 1893, N. F., Nr. 73 (*Innere Med.*, Nr. 25). 26. Grandy.—*Centralbl. f. allg. Path. u. path. Anat.*, Jena, 1897, Bd. viii, S. 513. 27. Klein.—*Wien. klin. Wchnschr.*, 1896, Bd. ix. S. 701. 28. Habel.—*Centralbl. f. innere Med.*, Leipzig, 1898, Bd. xix. S. 9. 29. Herzog.—*Centralbl. f. allg. Path. u. path. Anat.*, Leipzig, 1897, Bd. viii. S. 1008. 30. Berkart.—"On Bronchial Asthma," Second Ed., 1889. 31. Gee.—*Lancet*, London, 1899, vol. i. p. 743 and 813. 32. A. Fränkel.—*Deutsches Arch. f. klin. Med.*, Leipzig, 1902, Bd. lxxiii. S. 484. 33. Lange.—*Ibid.*, 1901, Bd. lxx. S. 342.

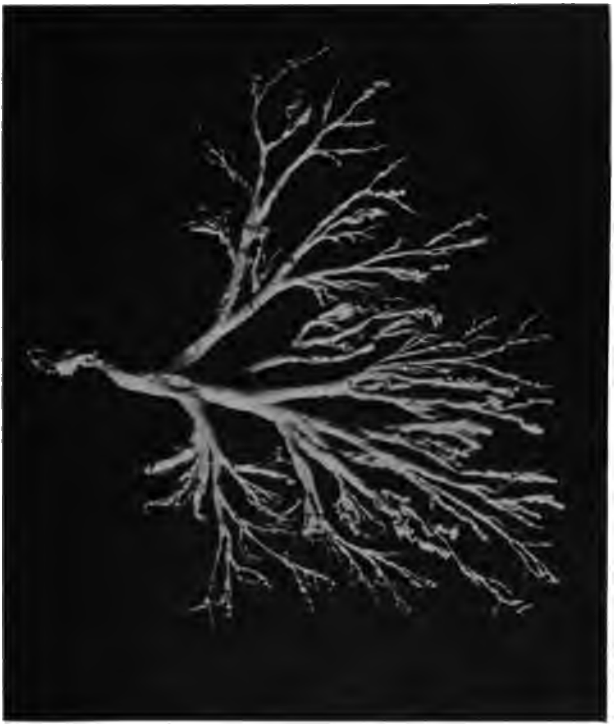


Fig. 2.—The Third Cast, half the natural size.

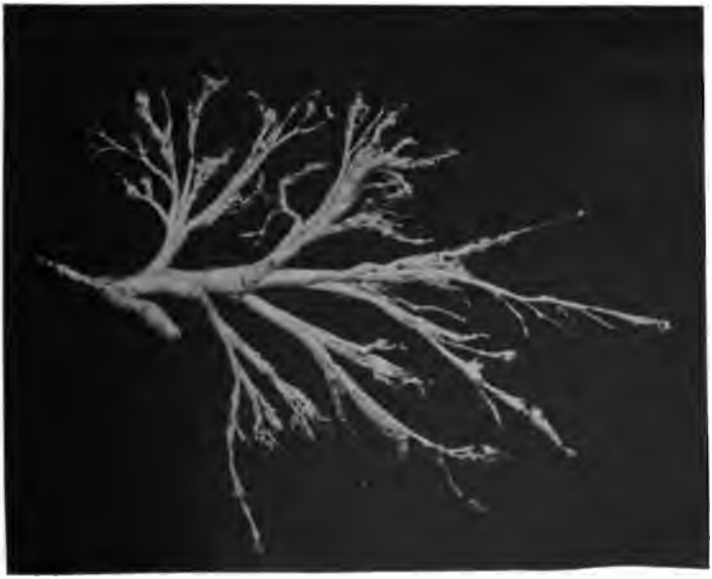


Fig. 1.—The Second Cast, half the natural size.

THE CARDIAC MUSCLE.[1]

By JOHN M. COWAN, M.D., F.F.P.S.G., *Lecturer on Medicine, Western Medical School, Physician to Out-patients, Western Infirmary, Glasgow.*

(PLATES IV.–VI.)

I WISH to draw your attention to a special point of cardiac disease, to which I think scarcely enough attention has been paid, namely, disease of the myocardium. Since Laennec's time auscultation has taught us the signs of the various valvular defects, and clinical experience has gathered together so many facts, that at the present day we may make a diagnosis of such lesions more accurately than is possible in the case of the other internal viscera. I do not intend to refer in detail to disease of the cardiac valves, but I will make them in general the theme of my remarks, as most of you have already seen many such cases in the wards.

Acute endocarditis is a common accompaniment of such diseases as rheumatism and chorea, but it rarely causes death during the acute stage, unless some further complication, such as pericarditis, supervenes. In the great majority of cases the acute illness comes to an end, but the convalescent patient is left with a flaw in his cardiac machine, some leak or imperfection in action of one of the valves. The extent of the damage of course varies in different cases. The fault may be so slight that the heart is scarcely incommoded, or again may be so great that the circulation of the blood can scarcely be maintained.

Let us take, as an example, a case of mitral regurgitation, and consider the mechanical results of such a lesion. Normally, in the adult man, about 6 oz. of blood are expelled into the aorta with each ventricular systole. Let us suppose, however, that in the case which we are considering 2 oz. are driven through the open mitral valve into the left auricle, so that only 4 oz. are left for the aorta. As a result the systemic arteries are relatively empty, and the pulmonary circulation and the left auricle are over-full; and, in course of time, the pulmonary congestion would react on the right heart, and congestion of the systemic venous circulation ensue; and such a failure in the cardiac work would rapidly cause death.

To ensure the proper filling of the arteries in such a case, the capacity of the left ventricle must be enlarged so that it can contain 6 oz. for the aorta and 2 oz. for the left auricle, *i.e.*, it must hold 8 oz. instead of 6 oz.; and it will require more power to enable it to expel 8 oz. of blood, so that its muscular wall must be thickened. The first result, then, of mitral incompetence is that the left ventricle must become larger and stronger, if the cardiac work is to be carried on satisfactorily.

---

[1] A lecture delivered to the Medico-Chirurgical Society of the University of Glasgow, on 13th November 1903.

There are also effects on the right heart. The walls of the auricles are thin and their muscular strength slight, and their contraction has probably little effect on the circulation of the blood. With each ventricular systole the left auricle receives 2 oz. of blood from the left ventricle and the usual 6 oz. from the pulmonary veins, so that it is over-distended, and from its weakness becomes dilated. Muscular hypertrophy also takes place, but never to any great extent, and so there is stasis of the blood in the auricle; and since there are no valves in the pulmonary veins, stasis as well in the pulmonary capillaries, and stasis in the pulmonary artery.

How can this be overcome? If the right ventricle contracts more forcibly it may raise the blood-pressure in the pulmonary artery to such an extent that the stasis is overcome; and it is in this way that the defect is made good. The increased work thrown upon the right ventricle of course necessarily leads to hypertrophy of its walls.

By these means—dilatation of the left ventricle and hypertrophy of its walls, dilatation of the left auricle, hypertrophy of the right ventricle—the mechanical defect may be overcome and the mitral reflux can be "compensated."

The greater the leak, the greater must be the necessary changes if the cardiac work is to be carried on successfully. Sometimes the alteration in size of the heart is easily appreciated by physical examination; sometimes again there seems to be none. And it is to these points, rather than to the character of cardiac murmurs, that we must pay attention, if we are to gauge aright the degree of valvular lesions.

In the healthy individual the heart is but rarely driven at its full power; under ordinary conditions it probably works at about half its maximum, thus leaving a considerable margin of potential energy, which can be utilised as occasion demands—for instance, on severe exertion; and the muscle of the heart, like muscle elsewhere, possesses the power of hypertrophy, if still more power is called for.

Hypertrophy, however, is only possible within certain limits, which are governed by factors which we can only guess at; and in some cases of valvulitis, the defect is so extreme that the mechanical fault is never compensated.

CASE 1.—A young man, who died in the Western Infirmary, had aortic cusps which were so useless that they opposed absolutely no obstacle to the regurgitation of fluid from the aorta into the left ventricle, as tested post-mortem. He had suffered from acute endocarditis in the late autumn of 1901, and he died early in 1902 without ever having been able to walk about without cardiac distress.

But happily such an extreme lesion is rarely met with. In the great majority of instances the acute inflammation passes away, and reparative changes occur in the valves, and after a period of weeks or months a maximum defect is reached which remains stationary in its degree.

As a result of the defect, changes take place in the heart—increased capacity of chambers, hypertrophy of muscle—which compensate the fault and allow of efficient cardiac action; but the margin of power above that now ordinarily exercised is always less in such cases than in the undamaged organ, and in consequence less exertion can be undergone without undue discomfort to the patient. In some cases, however, compensation may be so perfect as to leave little to be desired.

A patient of mine, a farmer, æt. 25, has had since childhood marked aortic stenosis, which for the last ten years has never prevented him from undergoing the necessary amount of physical exertion which his occupation entails. Broadbent narrates the case of a doctor, the subject of aortic regurgitation, who for eighteen years had successfully carried on a large practice; and I have seen a case of mitral stenosis in which the lesion was known to have existed for more than five years without any cardiac symptoms having been manifested.

With a stationary flaw, then, the cardiac work may be carried on for many years, if the defect is slight and the muscular hypertrophy sufficient; but unfortunately all valvular lesions are not stationary. As the tendency of new-formed connective tissue is always towards contraction, any stenosis of a valve will year by year become more extreme; or a fresh attack of rheumatism may light up the endocardial inflammation; for, as you will remember, endocarditis is especially apt to occur in patients who are already the subjects of a chronic valvular lesion.

In another class of cases the lesion is the result of atheroma, and chronic and progressive in its character. An old man who is at present under my care has a heart whose aortic valves were quite competent in the spring of 1902. Last winter, after any exertion, an aortic regurgitant murmur was audible on auscultation, though when he was at rest in bed it disappeared; and now it is present under any condition, so that the leak, at first temporary, has become permanent, and will evidently, as time goes on, some day become so great that his cardiac muscle cannot compensate the fault.

But, putting such cases aside, and considering only those in which the lesion is stationary, we know that, in the majority of instances, in course of time symptoms of cardiac failure, and eventually death, ensue; and as the one factor remains constant, it is to the other, the muscle of the heart, that the failure must be ascribed.

Muscular failure may occur in two ways. As I said just now, a heart whose valves are damaged works nearer to its maximum power than does the healthy organ, and an extra strain which may be easily overcome by the latter may be too severe for the former.

Case 2.—An old man, a foreman in an engineering shop, had never had any cardiac symptoms until shortly before he came under my observation. One day, when his men were moving a heavy model by hand, it seemed in danger of falling, and he at once sprang to the rescue and exerted himself severely. Immediately afterwards he felt sick and breathless, and he had to lie down for some twenty minutes before he was able to move; on walking home he took an hour to cover the distance instead of the usual ten minutes, and even then had to sit down several times on the way. The extra strain which the physical exertion entailed had been too great for his cardiac muscle to overcome, and the symptoms which ensued persisted for some weeks before compensation was effected.

There are other causes besides physical exertion. In all mitral cases, and ultimately in all aortic ones, compensation is to a large extent effected by the right side of the heart, and any increase of its work from pulmonary congestion may be sufficient to lay the heart upon its back.

Case 3.—A man of 60, who died of cardiac failure, the sequel to arterial degeneration, had always considered himself healthy, and was able to perform his duties as a foreman blacksmith until some ten days before his death. He, however, caught cold, and bronchitis followed, accompanied by cardiac symptoms.

Often, however, symptoms ensue in the class of cases which we are considering, without any definite evidence of extra-cardiac strain; the muscle itself is at fault, and I wish to demonstrate to you to-night some of the lesions which affect it, and the causes which produce them.

The muscle cells in a normal heart vary greatly in size, those of the left side being larger than those of the right, while the cells of the ventricles are larger than those of the auricles; and even adjacent muscle cells may be of very different sizes.

In a heart which is notably larger than usual, the average size of cell is always considerably greater than normal, the increase being evident in both diameters, but especially in the transverse one; and it seems that it is in this way and not by a new formation of muscle cells that the cardiac power is increased (Plate IV. Fig. 1). Conversely, in atrophied hearts, the muscle cells are notably smaller than normal, and the amount of pigment at the nuclear poles is often excessive (Plate IV. Fig. 2). Atrophied hearts are found in the greatest perfection in cases of chronic ill-health attended by general wasting, *i.e.* phthisis and diabetes; but hearts which by weight and to the naked eye give but little evidence of atrophy, may microscopically show atrophied cells. Any condition which tends to lower the general health may thus, by the consequent atrophy of the cardiac muscle cells, lead to such a degree of weakening of the heart's power as to occasion a loss of compensation, and failure will occur more readily the nearer to the maximum that the cardiac work is carried on.

Local causes may also produce atrophy by interference with the proper supply of blood to the muscle through the coronary arteries; and, as is well known, these vessels are not infrequently degenerate; and interference with their lumen by atheroma, either of the vessels themselves or of their orifices in the aorta, may thus lead to weakening of the cardiac power.

Vascular degenerations are most frequently a senile result, but syphilis and alcohol often anticipate their onset, and the acute diseases sometimes produce a like result. Such an effect is more likely to affect the coronary vessels if the acute process is in their vicinity, as, *e.g.*, acute valvulitis, pericarditis, etc., but it also occurs in the exanthemata, pneumonia, and many other diseases. While the aorta in its early course is the most frequently degenerate of all the arteries in the body, the coronary vessels are not far behind them. According to Lobstein, these arteries occupy the seventh place in order of frequency; according to Rokitansky, the eighth; according to Huchard, the third. And it must be remembered that atheroma of the superficial vessels is not a constant, though a common, accompaniment of coronary implication.

In the acute infections the change known as "cloudy swelling" is found almost universally among the viscera, the cells of the kidneys and intestine showing it very rapidly, even a few hours after the onset of the disease. The cardiac muscle, too, shows similar changes, the cells being filled with minute granules which, in the fresh state, obscure all the proper structures. In stained specimens these granules are generally not apparent, but the muscle cells are seen to be smaller than normal, and many of the contractile fibril bundles have disappeared, so that the central perinuclear mass is larger than usual. The transverse striation also is indistinct (Plate IV. Fig. 3). But as the poisons in the process of excretion act in a more concentrated degree upon the kidneys and the bowel, it takes longer for "granular degeneration," as I term it, to develop in the cardiac muscle. It is almost always present, however, if a toxæmia has existed for any length of time, and of necessity it materially weakens the force of the cardiac systole; and consequently we find that pneumonia, for example, proves fatal most frequently in elderly persons, or in those in whom the heart is being driven at nearly its full power, from some flaw in the mechanical portion of the machine.

Fatty degeneration of the myocardium is not uncommon. There are two varieties met with, of different etiology. In one set of cases the fatty degeneration is patchy in its distribution, —little yellow lines, perhaps a millimetre in breadth, alternating with portions of more normal colour,—the well-known thrush-breast appearance. It is in anæmic cases that this condition is best seen, and microscopic examination reveals its causation. If you will look at the section of cardiac muscle (Plate IV. Fig. 4) stained with osmic acid, you will see in the centre a minute arteriole. Immediately around the vessel the muscle cells are scarcely blackened, but some little distance away almost the whole of every cell shows evidence of degeneration, so that it is the parts farthest away from the nutrient vessels, *i.e.* those where the blood supply is the less free, which become fatty earliest and in the greatest degree. In most of the cases of "thrush-heart" fatty degeneration (the para-arterial variety), the cause is anæmia —post-hæmorrhagic, pernicious, etc.—but in a few instances it is due to local arterial obstruction, the local anæmia causing a local thrush-breast.

In the second variety the distribution of the fatty change is not patchy but general, large areas or perhaps the whole of the ventricular muscle being affected, and in these cases the origin is different.

If you will look at the section from a case of pericarditis (Plate V. Fig. 5), you will notice along the pericardial border some layers of cells which show the osmic acid reaction, but these degenerate cells are situated exclusively along the pericardial margin. Their degeneration is evidently due to the effects of the pericardial inflammation, *i.e.*, to the toxic products of the bacteria spreading along the lymphatic channels, and in cases of myocardial abscess a similar state of matters may be observed.

This toxic variety, then, differs from the anæmic kind, in that it is not patchy, at any rate in the thrush-breast acceptation of the term, but is present where a definite intoxication is acting.

The degeneration may be widespread if the intoxication is general, and this is not infrequently the case. Such hearts, of course, do not present the thrush-breast appearance, but are paler in tint and rather more yellow than normal. They cannot be accurately diagnosed by naked-eye examination. In the section (Plate V. Fig. 6), every cell is fatty, and the condition was widespread throughout the heart. The toxæmia in this case was uræmic in nature, the patient being the subject of renal cirrhosis, and this toxæmia caused a general change in the same way that the pericarditis caused a local one. But in the second case the poison was present in the blood-stream, in the first in the lymphatic channels.

There are many other causes besides renal insufficiency. Long-continued sepsis is a common one, and alcohol is another. One of the most general and widespread examples of fatty degeneration that I have met with, came from a healthy man who had been drinking heavily for more than two weeks before his death in a street accident. Alcoholics bear acute disease badly: of eight hearts which I have examined from cases of pneumonia, who were said to have indulged freely in alcohol, six showed fatty degeneration.

Experimentally, fatty degeneration of this kind can be very easily produced by the injection of phosphorus or chloroform into the subcutaneous tissues of a rabbit, and the continued administration of arsenic produces the same effect.

There is another form of fatty heart which must be clearly separated from those which I have just referred to, namely, fatty infiltration.

The subpericardial connective tissues contain normally a certain quantity of fat, but it is, in normal hearts, strictly confined to the pericardium, and never infiltrates the muscle.

In some cases, however, the connective tissue of the myocardium proper contains large quantities of fat around the vessels, in the main connective tissue strands, or even between the individual muscle cells themselves; and the presence of this useless bulk in the muscle necessarily interferes greatly with the cardiac power.

It may interfere as well from another reason. As you will see, the muscle cells in the immediate vicinity of the interstitial fat are themselves fatty (Plate V. Fig. 7), and this seems always to be the case, though the explanation is obscure.

Generally speaking, fatty infiltration of the cardiac muscle coincides with a large excess of the connective-tissue fat, both beneath the pericardium and throughout the body generally, but the rule has its exceptions, and the change may be only marked in the cardiac wall. In some cases this is due to a lingering illness with consequent malnutrition and loss of the general fat, but in other instances the explanation is not obvious.

There is nothing special to note with regard to the occurrence of cardiac obesity. It seems to be due to the same causes as those which induce the general condition.

In normal hearts the connective tissue is very scanty, but in disease the amount may be greatly increased, and fibroid patches may be visible to the naked eye. Sometimes the lesion is single, perhaps of considerable size; sometimes it is multiple, and then most frequently minute. But in any case it means that so much muscle, so much power, is lost, and what one may term the elasticity of the heart is gravely interfered with by the presénce in it of these more or less rigid masses.

Fibrosis of the heart is usually the result of alterations in the coronary circulation, whether caused by lesions of the arteries themselves—atheroma, thrombosis, embolism—or of their orifice above the sigmoid valves (aortic atheroma, etc.).

The main coronary trunks anastomose with each other in the interventricular and auriculo-ventricular sulci; but the terminations of these arteries within the muscle, the nutrient vessels, do not anastomose. In consequence, blocking of a nutrient vessel causes necrosis of the corresponding muscle (infarct); and if the patient survives, the dead material is absorbed and replaced by connective tissue in the usual way. If the area involved is of any size, recovery is little likely to occur, and the patient dies, more or less rapidly, from cardiac failure.

CASE 4.—In this specimen, which comes from the Western Infirmary Museum, the apical parts of the wall of the left ventricle are very thin, and the muscle is represented by a pale yellow substance surrounded by a hyperæmic border. The corresponding branch of the left coronary artery was found to be atheromatous, and its lumen was completely occluded by blood-clot. The patient, a man æt. 55, was suddenly seized with severe pain in the thorax and breathlessness, and died within eight days of the occurrence of symptoms.

It is easy to understand that the necrosis of the muscle would entail so great a loss of power that the cardiac work could not be satisfactorily accomplished, and symptoms consequently ensued.

Rupture of the heart is another possibility in these cases. If the necrotic muscle comes near the endocardium, the intraventricular pressure may be sufficient to rupture the membrane, and the blood will ramify with each systole into the muscular substance, and in time may perforate the pericardium and allow the cardiac contents to escape into the pericardial sac, thus entailing the almost immediate death of the patient.

Partial coronary occlusion leads to a somewhat similar result. If the blood-supply to any particular cells is insufficient, they atrophy and may ultimately disappear, their place being taken by the less highly organised connective tissue.

On examining a section from such a case (Plate VI. Fig. 8) you can often see that the muscle in the vicinity of the arteries is intact, while that in the periphery, a little distance away, has disappeared. The distribution of the fibrosis is para-arterial, the same as that of the fat in the anæmic fatty degenerations; and the cause is identical, failure of the blood-supply; but in the one case fatty degeneration results, in the other the cells atrophy and disappear. This difference in the final effect is perhaps due to the defect being in one case qualitative, in the other quantitative.

There is another form of fibrosis of the heart, of different etiology. In most of the acute infections,—the exanthemata, pneumonia etc.,—one finds in the heart, as well as in some of the other viscera, little collections of mononuclear cells. Some of these are obviously lymphocytes, but others are probably of fixed-tissue origin; and we must regard these collections as the result of a local intoxication (Plate VI. Fig. 9).

Most often they are found around the arterioles, but sometimes they occur away from them, and in any marked example we find, as the result of the local intoxication, local degeneration of the muscle cells in the vicinity; and it is evident that if recovery ensues little patches of fibrous tissue will be left at the place.

In many fibrous hearts such lesions may be found, but the patches are always smaller than those of the para-arterial variety, though, on the other hand, they may be more numerous. In the section (Plate VI. Fig. 10), you will see that the small arteries are embedded in masses of fibrous tissue, and that the muscle which persists is situated a little distance away from them.

Most commonly, however, both varieties, para- and peri-arterial, are present in the same heart. The process is a mixed one, and consideration of the arterial causes reveals the reason. The vasa vasorum run in the tunica externa of the vessels, and it is evident that they must suffer in any fibrosis of this coat. The intima and the media have no capillaries; but, as you will remember, the elastic laminæ are fenestrated, presumably for purposes of nutrition. The blood in the vessel may afford some nourishment to these structures, but their main supply comes from the vasa vasorum; and if these are narrowed, the nutrition of the intima becomes defective, atheromatous patches form, and the lumen of the vessel, and in consequence the nutrition of the muscle which it supplies, is interfered with. I am not referring just now to the larger vessels, such as the femorals and carotids. It has been maintained that the calibre of these arteries is not interfered with by atheroma. However this may be, there is no doubt that the lumen of the smaller vessels is gravely affected by intimal lesions.

Conversely, endarteritis, if extreme, is rarely found by itself. The outer layer of the artery, in time at any rate, is interfered with by the process in the intima, and so peri-arterial changes follow on end-arterial.

Little local patches of fibrosis also result from mural endocarditis, but this is somewhat of a rarity, and the importance of this form of fibrosis is slight.

Pericardial inflammations, on the other hand, have but little effect on the fibrous structures of the heart. The fatty degeneration of the muscle which I showed you might result from it, is but a local effect, and never involves the muscle deeply, and a thickened pericardium is curiously distinct from the muscular tissue in the great majority of cases.

The direction of the lymphatic flow is responsible for this. The supply of blood to the muscle comes from external vessels, and in consequence venous and lymphatic flow takes place in the opposite direction, towards the pericardium, and but little effect on the muscle will be manifested.

I have by no means exhausted the various lesions which may affect the myocardium, but I have perhaps said enough; and I will have effected my purpose if I have attracted your attention to the importance of the cardiac muscle to the organism.

Anything which lowers the general health tends to lessen muscular power, and the nutrition of the skeletal muscles is a useful though rough guide to that of the myocardium; and as flabby muscles produce general weakness, so flabby cardiac muscle produces cardiac weakness. Any local cardiac lesion, whether endocardial or arterial, is a very special indication to maintain or improve the general nutrition of the patient. The heart is a very tolerant organ, and is capable of a fight against adverse circumstances which often causes admiration; but it is not fair to whip a willing horse too much, and digitalis, etc., cannot be expected to improve the power of the heart if the muscle is degenerate.

Lesions of the endocardium are but a small proportion, as you will find, of cardiac cases as met with with in practice; but what I have said is just as applicable to all the cases of what Balfour called the "senile heart" as it is to the valvular diseases, and it is not only applicable to cardiac cases proper. How does death ensue in enteric fever or in pneumonia? in probably the majority of cases from cardiac failure. In emphysema, in renal cirrhosis? very often from the same cause. But I need scarcely emphasise the importance of the myocardium any further, for it is in truth self-evident.

It is only from a knowledge of the pathological lesions which may cause myocardial failure, and a proper appreciation of the manner in which they arise and the modes in which they progress, that one can arrive at a reasonable diagnosis and a rational line of treatment for the individual case.

These is one more point which I wish to emphasise. In the acute infections, as I have said, various changes may occur in the myocardium—degeneration of muscle, connective-tissue overgrowth, arterial lesions; and we can often judge but inaccurately as to their intensity; and in the acute cardiac diseases, such results are much more common, if not invariably present, and much more severe.

A broken leg gets a month or more of perfect rest to ensure recovery, but often the damaged heart gets only a few days; and our patients should "hasten slowly" during convalescence from the acute infections, if they are to obtain the best results.

DESCRIPTION OF PLATES IV.-VI.

PLATE IV.

FIG. 1.—Hypertrophied muscle cells from a heart weighing 23 oz. (× 400.)

FIG. 2.—Atrophied muscle cells from a heart weighing 7 oz. (× 400.)

FIG. 3.—Granular degeneration of cardiac muscle. (× 1000.)

FIG. 4.—Para-arterial fatty degeneration, from a case of pernicious anæmia. (× 200.)

PLATE V.

FIG. 5.—Fatty muscle-cells in the vicinity of an inflamed pericardium. (× 50.)

FIG. 6.—Diffuse fatty degeneration, from a case of renal cirrhosis. (× 200.)

FIG. 7.—Fatty infiltration, showing degeneration of adjacent muscle. (× 400.)

PLATE VI.

FIG. 8.—Para-arterial fibrosis. (× 50.)

FIG. 9.—New-formed connective tissue around arteriole, from a case of infective endocarditis. (× 800.)

FIG. 10.—Peri-arterial fibrosis. (× 50.)

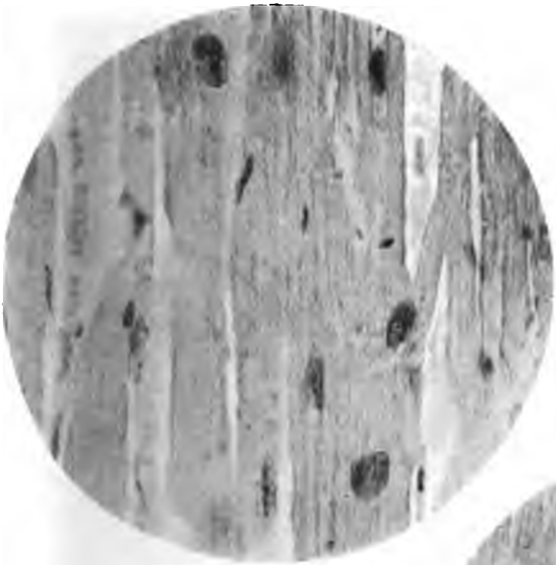


Fig. 1.

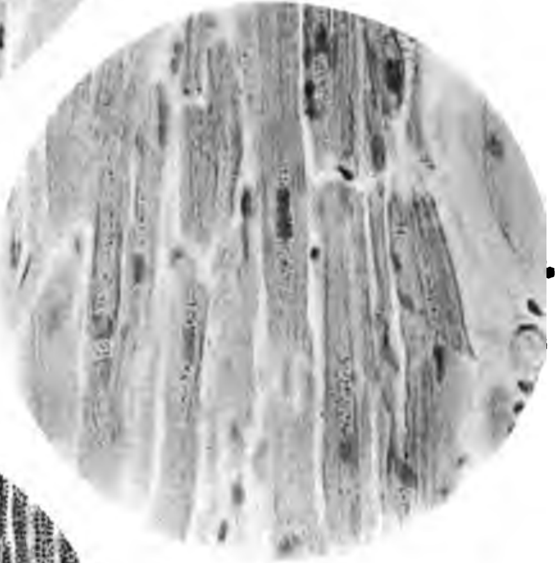


Fig. 2.

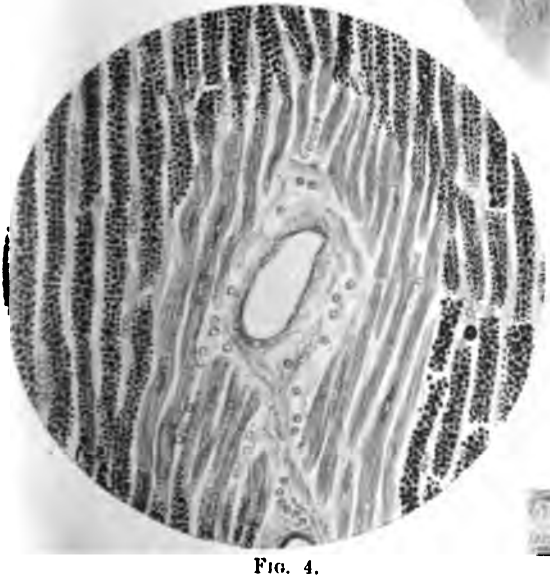


Fig. 4.

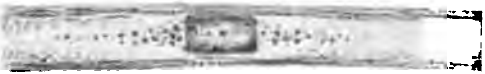


Fig. 3.

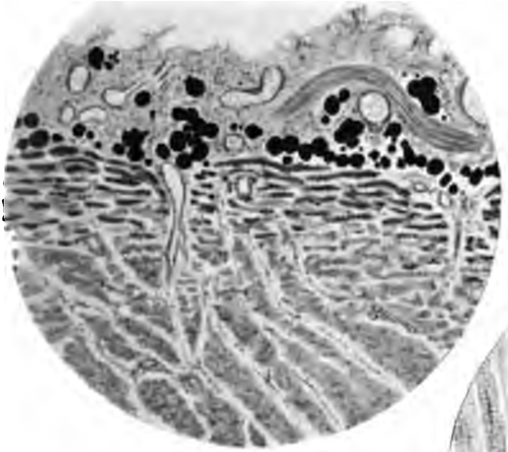


FIG. 5.

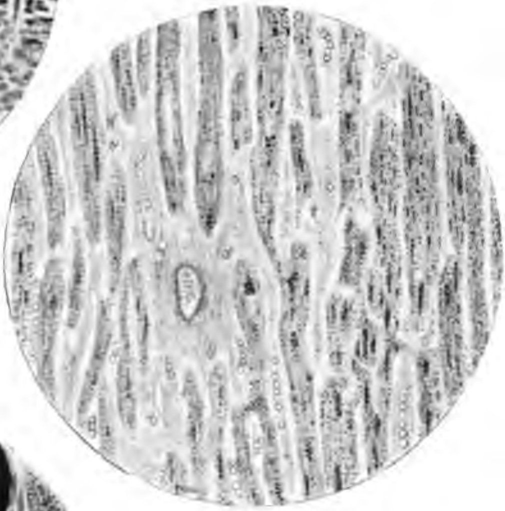


FIG. 6.

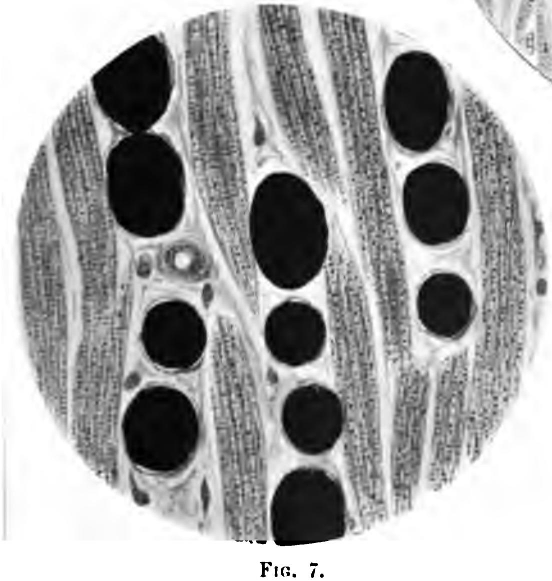


FIG. 7.

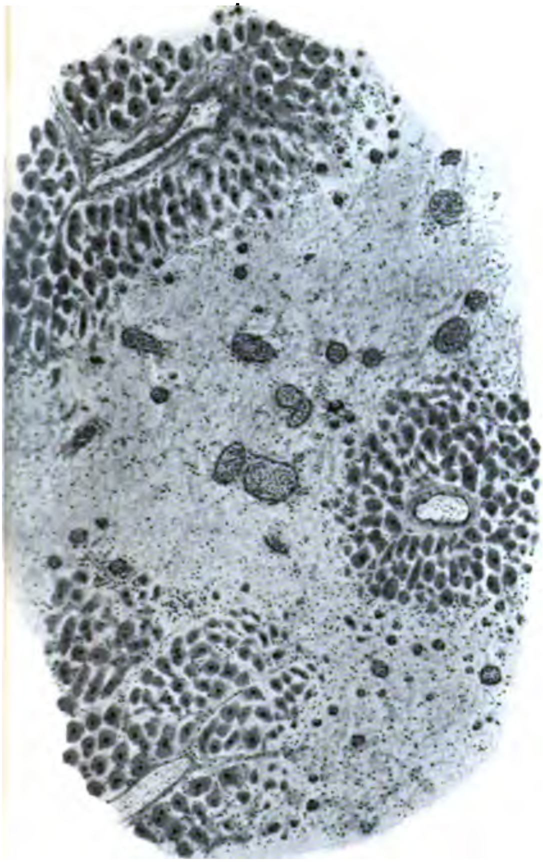


Fig. 8.

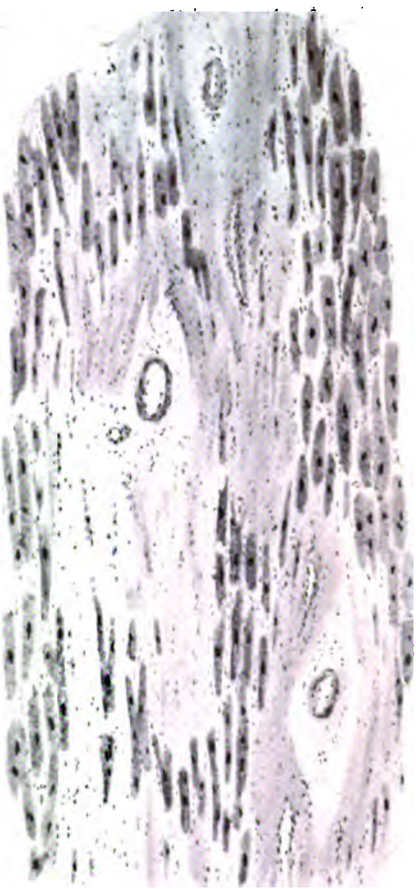


Fig. 10.

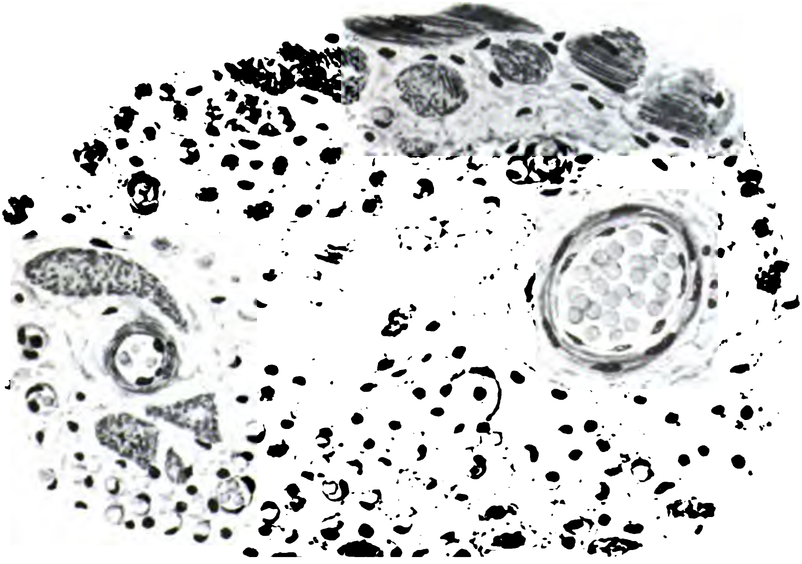


Fig. 9.

ON THE DIURESIS PRODUCED BY THEOCIN IN HEALTHY PERSONS.

By PROFESSOR H. DRESER, *Darmstadt*.

KOSSEL in 1888 discovered a new alkaloid in the extract of tea-leaves. After determining its chemical constitution, which he found to be 1:3 dimethyl-xanthin, he gave it the name of "theophyllin" in view of its origin.

Theocin, which is chemically identical with the above tea-alkaloid, differs from it in being produced by a complete synthesis on Professor Traube's method. The name "theocin" serves to distinguish the synthetic product both from the natural alkaloid, theophyllin (which is only obtainable in very minute quantities, and is therefore not available for general use), and from the product prepared from uric acid by the aid of the purin ring ready formed and present in the latter.

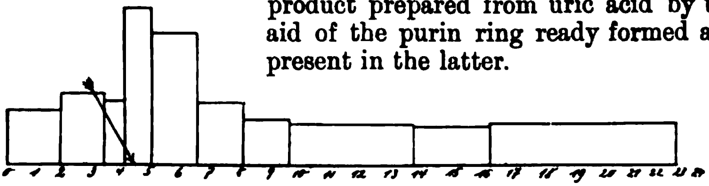


FIG. 1.—The effect of 0·5 grm. theobromine taken by a healthy person. Administration of 0·833 grm. agurin (equal to 0·5 grm. theobromine).

Kossel gave the name of "alloxan nucleus" to the one part—that containing the two methyl groups—of the twin though heterogeneous purin ring. The other part, *i.e.* that containing the non-methylated atoms of nitrogen, is, in modern terminology, known as the imidazol ring.

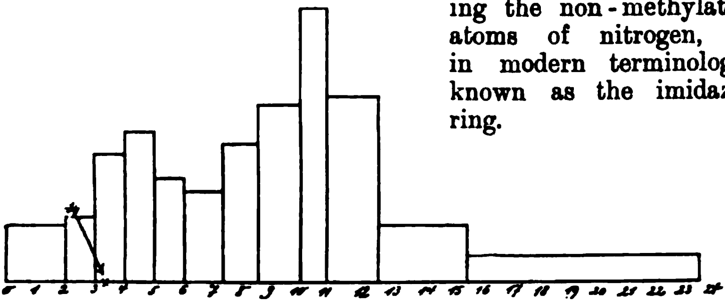


FIG. 2.—The effect of 0·5 grm. caffeine on a healthy person.

A comparison of the pharmacological properties of the products resulting at each stage of the synthesis made it evident to me that the valuable medicinal action of theocin is only apparent from the moment this "imidazol" ring is closed. As long as the circle is incomplete, the product has no diuretic action or exciting effect on the central nervous system, nor does it exercise the specific action of caffeine on the striped muscles.

In view of the therapeutic importance of the methylated xanthines as diuretics, experiments on healthy persons appeared to me to be essential for the purpose of completing and supplementing the tests on animals.

When making diuretic experiments on healthy persons, it must be borne in mind that the organism of the healthy man, in contrast to dropsical organisms, can only give off a small quantity of water. In order, therefore, to obtain comparable results, it is

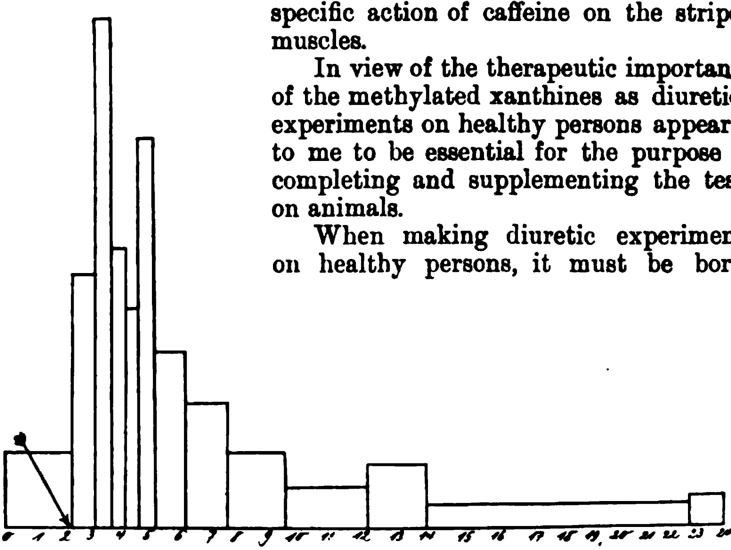


Fig. 3.—The effect of 0·5 grm. theocin on a healthy person.

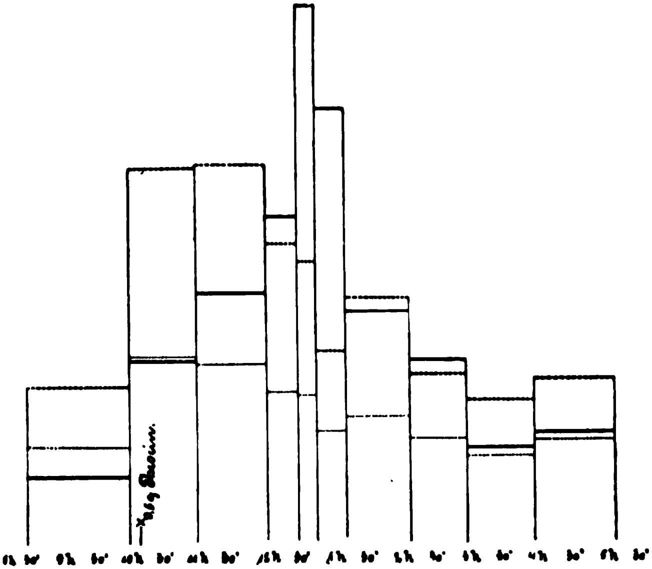


Fig. 4.—Effect of the administration of theocin followed by a drink of water.

necessary to maintain as far as possible a constant supply of available water in the organism. This was effected by giving the man each hour a quantity of water equal to that which had been passed in the form of urine during the preceding hour. For a daily excretion of urine of 1500 to 1800 c.c., the rapidity of secretion is found to be 1·04 to 1·25 c.c. per minute. Observation for one hour before the diuretic to be tested is taken, suffices to determine whether the activity of the kidneys is greater or less than the normal average. The most effective means of securing uniform excretions of urine is by giving weak tea, or, still better, pure milk for breakfast. If water is taken every hour afterwards, it becomes possible in most instances to keep the rate of excretion within such limits that the maximum and minimum deviations from the average are found not to exceed about one-third of the latter. Moreover, there is no abrupt transition from maximum to minimum, or *vice versâ*, during a single hour, but the two extremes merge into each other by progressive stages in the course of several hours.

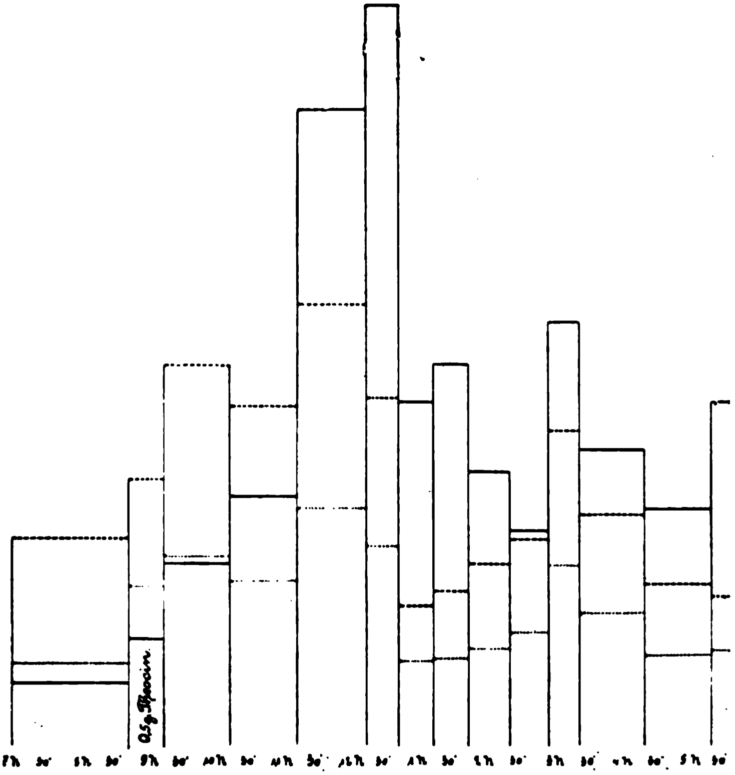


FIG. 5.—Effect of administration of theocin followed by water.

A representation of the results of the experiments by diagrams renders it particularly easy to compare these slight fluctuations in the urinary excretion (which are unavoidable in spite of all precautionary measures) with the changes produced when the action of a true diuretic sets in. Therefore, in place of my reports, I give a diagram constructed on the basis of these results, and affording a ready view of [them. On the horizontal abscissa

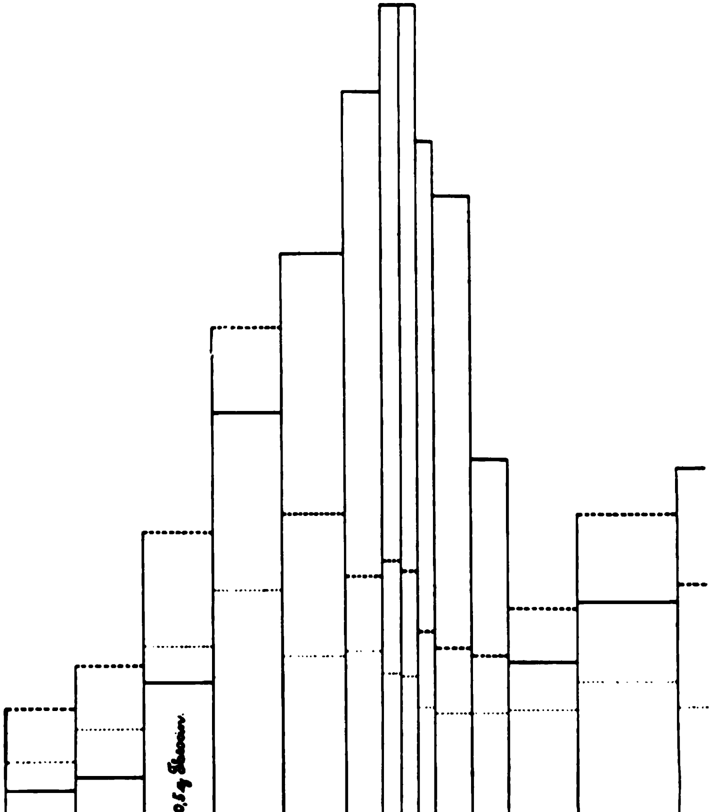


FIG. 6.—Administration of theocin followed by water.

representing the time, the calculated excretion of urine per minute is denoted by black horizontal lines as ordinates, the height of which above the abscissa is proportional to the rate of excretion. The volume of urine produced during the time of observation is represented by the rectangle, the base of which is formed by the corresponding part of the time abscissa, and the height by the line denoting the rate of excretion.

Of all the purin bases given in solution, the diuretic action of theocin was the most powerful (cf. Figs. 1, 2, and 3).

The expulsion of water alone from the tissues of dropsical patients would, however, not answer the purpose, as the following considerations will show. The blood, and also the dropsical fluid, in spite of the diminution of albumin, contain the same percentage of salts as the blood of healthy organisms, or an even greater one. This was proved by the analysis of Carl Schmidt (1850) and Hoppe-Seyler. The salts of the blood and of the tissue fluids represent almost exclusively those constituents which cause the retention of the water in the organism. It is these salts, and not by any means the proteids, which retain such a quantity of water in the blood that its freezing-point is subject only to very slight fluctuations about the standard value, 0·56° C. This is likewise the freezing-point of 0·91 per cent. NaCl solution. A gramme of salt, therefore, retains from 100 times to 110 times its weight of water in the body. It is, further, a very striking fact how rapidly the blood regains its ordinary freezing-point of 0·56° C. after experimental changes which had modified it. For this reason it may be assumed that the elimination of water alone, brought about in a dropsical patient by a diuretic, would not result in any lasting success, as the salts remaining behind in

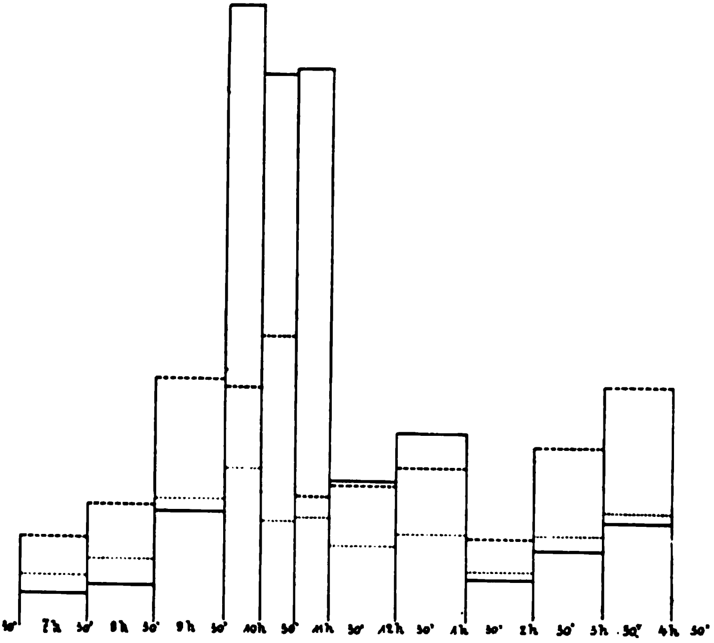


FIG. 7.—Diuresis after having taken, from nine to ten o'clock, 1500 c.c. of water.

the organism would, when nourishment and fluids were again taken, retain once more as much water as was previously expelled, as soon as the effect of the diuretic had ceased owing to its excretion.

In view of the above, really effective treatment of dropsical conditions should aim at the elimination, not only of the water, but also of the salts which retain the water in the body.

We know from von Schrœder's well-known researches into the diuresis caused by caffeine in rabbits, that in addition to the water, there is an increased excretion of solid constituents in the urine. Von Schrœder had in view particularly the expulsion of nitrogenous substances, owing to their connection with uræmic poisoning. In the year 1899, Katsuyama, experimenting on starving rabbits, observed a considerable increase in the excretion of sodium in the urine after the use of caffeine, whilst the elimination of potassium hardly showed any perceptible increase.

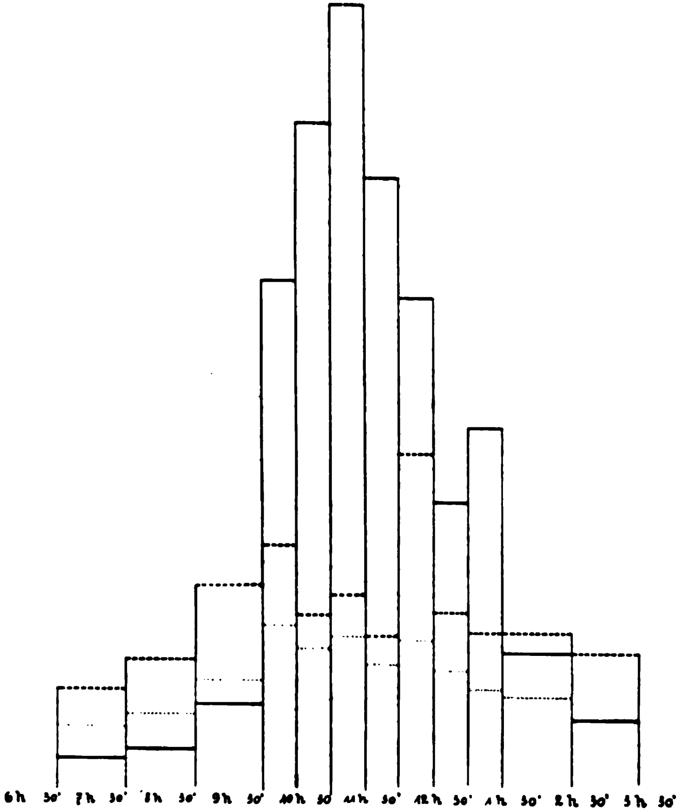


FIG. 8.—Diuresis produced after having taken, from nine to ten o'clock, 1500 c.c. of beer.

As a quantitative chemical analysis with regard to the several constituents of each hourly secretion of urine was not feasible for various reasons, a more summary process had to be adopted. For this purpose I determined, by means of the freezing-point of the urine, the total amount of its osmotically active constituents, and by measuring its electric conductivity I ascertained its contents of ions, which originate in the dissociated salts of the urine.

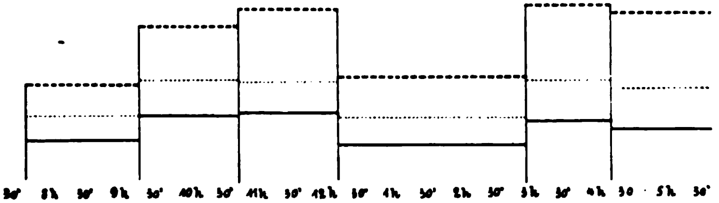


Fig. 9.—A parallel experiment to Fig. 10, without theocin and without being followed by water (540 c.c. of milk taken at breakfast).

The results observed in these diuretic tests are recorded on the appended diagrams in the following way:—"The quantity of water excreted per minute is again denoted by a black horizontal line, the total quantity of osmotic active constituents by dotted horizontal lines, and the ions due to the salts and serving to conduct the electricity by punctured horizontal lines. The height of the several lines above the general time abscissa represents the efficacy with regard to these three kinds of excretion.

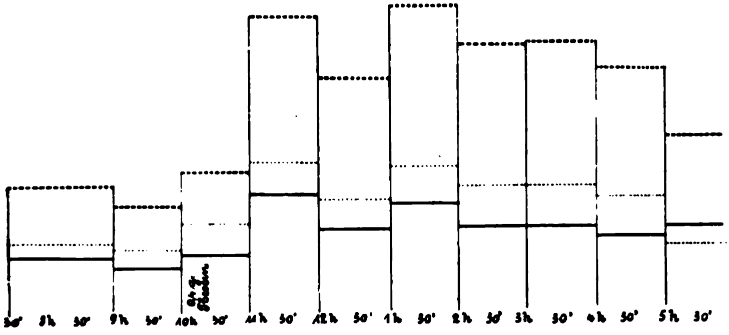


Fig. 10.—The effect of administration of theocin *without* being followed by water (540 c.c. of milk taken at breakfast).

The accompanying diagrams show that theocin not only promotes the excretion of water, but likewise increases the elimination of the constituents held in solution. This increase is particularly noticeable in the salts, in agreement with Katsuyama's statement as to the increased excretion of sodium. If the quantity of electrolytes eliminated after the administration of theocin be compared with that excreted after copious drinking of water

(Figs. 4, 5, 6 with 7, also explanations of lines, Fig. 13), it will be found that the increased passage of water through the kidneys is to a certain extent also accompanied by the discharge of salts, but by no means in such a striking degree as in the case of theocin. In the diuresis after water, in contrast to that after theocin, the increase in the expulsion of non-electrolytes (such as urea) is relatively greater than that of the electrolytes or salts. The same is, perhaps, true in a still greater degree of the diuresis produced by drinking beer (Fig. 8). In fact, if only the proportion of electrolytes to the sum of osmotic active constituents were taken into account, one would be led to conclude that there is a retention of salts in the organism, as compared with the previous normal condition, under the influence of beer. The diagram, however, shows that there is still a slight increase in the excretion of salts. In any case, those constituents which cause

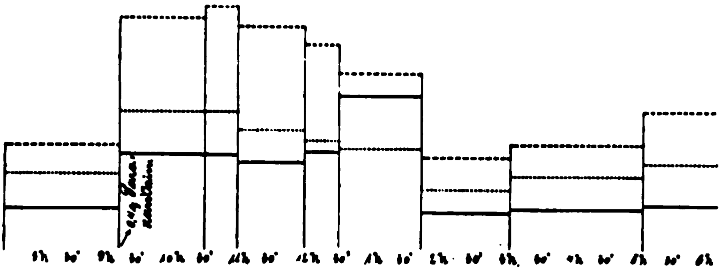


FIG. 11.—The effect of administration of paraxanthine (0·4 grm.) followed by a drink of water.

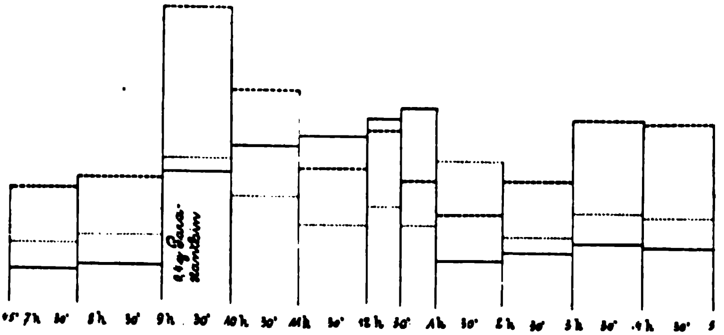


FIG. 12.—The effect of the administration of paraxanthine (0·4 grm.) followed by a drink of water.

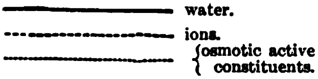


FIG. 13.—Explanation of lines.

the osmotic retention of the water, and which are instrumental in regulating the freezing-point of the blood and lymphatic fluids, are by no means so specifically expelled as under the influence of theocin. As the healthy organism, in contrast to that of the dropsical sufferer, possesses but a small store both of salts and liquid requiring to be expelled, we see the excretion of salts actually falling off at a time when the diuretic efficacy of theocin in the elimination of water is still rising. This is due to the fact that the kidneys are still able, owing to the continued supply of water, to yield to the diuretic stimulus of theocin, whilst the store of salts was soon exhausted. These relations can be made conspicuous in the diagrams by joining the points of bisection of the punctured horizontal lines, and likewise those of the black horizontal lines (water excretion). The connecting lines then form two curves, one of which attains its maximum before the other, and is already sinking whilst the other is still tending towards its maximum.

The excretion of electrolytes is, however, also specifically promoted by theocin, when, by intentionally suspending the administration of water, its augmented secretion is almost entirely arrested. This fact is illustrated by Figs. 9 and 10. The rise in the elimination of salts, though slightly diminished (as it is by no means assisted by the cessation of water supply) continues for some time longer than in the experiments in which the water passed by the kidneys was replaced.

A small quantity of paraxanthine, prepared according to E. Fischer's patents, was also at my disposal. I tried it in the same way as theocin, in two experiments on persons with subsequent drinking of water. The two paraxanthine diagrams (Figs. 11 and 12) show that the effect on the excretion of electrolytes was just as intense as in the case of theocin; but the maximum rate of secretion of water under the stimulus of paraxanthine only attains from one-fourth to one-fifth part of that observed from theocin. Moreover, in the case of theocin, contrary to expectation, the diuretic effect lasted longer than in the case of paraxanthine.

At all events, these experiments on healthy persons have proved that theocin possesses pronounced properties for promoting the excretion, not only of water, but also of salts, a result which might have been expected after Katsuyama's rabbit experiments with caffeine. We may therefore anticipate that, in the pathological condition of dropsy likewise, it will expel the salts retaining the water, and release the latter.

There is no doubt that diuresis obtained in this way is far more rational, from the point of view of effecting a cure, than the administration, on the one hand, of saline diuretics, or, on the other hand, of the medicinal wood decoctions and diuretic infusions, the latter of which methods, owing to the quantities of warm water in which the decoctions are taken, merely produces an effect similar to the diuresis due to water-drinking.

THE RELATIONS OF THE INSANITIES TO CRIMINAL RESPONSIBILITY AND CIVIL CAPACITY.

By Sir John Batty Tuke, M.D., F.R.C.P. Ed.; and
Charles R. A. Howden, M.A., *Advocate.*

II. General Consideration of the Acquired and Congenital Insanities.

The types of insanity detailed in our former paper are dealt with in the various text-books on mental disease, and will be treated from our own point of view later on. A cursory general consideration of them is, however, necessary here, for the purpose of differentiating between the acquired insanities and the insanities of degeneration and defect.

The most numerous cases of insanity arise from a morbid process which alters the hitherto normal mental function, and changes the previous character of the individual. In a large proportion of such cases the morbid mental phenomena are the result of diseases affecting the general system, which are not necessarily accompanied by insanity. We have already said that the delirium of the various forms of fever is not generally included under the generic term, partly because the mental symptoms are overshadowed by the prominence of the more persistent symptoms of bodily disease, and partly because experience has shown that they are generally evanescent. On the other hand, in the case of general paralysis of the insane, which until recent times was frequently confused with cases to which it bore no relation, the mental and physical symptoms are marked equally. Insanity is frequently, but not necessarily, associated with epilepsy; and hysteria is almost invariably accompanied by mental alienation. General paralysis is ascribed by certain authors solely to the action of syphilis; but there can be no doubt that it is due to other causes, and also that specific disease produces trains of symptoms dissimilar to general paralysis. Injury to the head is a well-known cause of insanity.

In a large number of instances, however, we are not yet able with certainty to connect insanity with any definite pathological condition, and such cases are most conveniently and naturally classified according to the conditions under which they arise. We cannot, of course, be absolutely certain that the same cause may not produce different morbid mental conditions, or that different causes may not produce apparently analogous trains of symptoms; but certain of these groups which proceed from common causes are also characterised by common features, and for the present purpose it is especially convenient to keep those cases together which are united by a common origin and mode of occurrence.

Midway, so to speak, between the groups where causation is definite and those where etiology is presumed, the toxic class may be instanced. That insanity frequently follows on the abuse of alcohol and certain drugs is an only too patent fact; but the term "toxic" comprises a much longer category of morbific influences whose action we for the most part presume. As the study of bacteriology develops it is certain that the action of the products of micro-organism will be found to account for many brain disturbances. At the present moment, for instance, sepsis is pretty generally accepted as the immediate cause of puerperal insanity, although in the absence of definite proof it is allowed to stand in a group by itself. Indeed, there is good reason for believing that such a nosology as has been suggested will be upset at many points by the advance of the science of bacteriology, and it is only to be regarded as provisional and convenient in our present state of knowledge.

The regularity of the type of symptoms occurring at the adolescent, climacteric, and senile periods justifies a clinical classification. It is true that the morbid anatomy of the senile period is fairly defined, but the lesions demonstrated are not invariably associated with insanity, and we are therefore checked in assigning them a definite morbific agency: and although we have a right to presume that metabolic changes set up by the establishment or arrest of secretions connected with the generative functions, at the adolescent and climacteric periods, exercise an important influence in producing insanity in predisposed persons, it is merely a warrantable assumption that such is the case.

The largest and, in some respects, the most prominent clinical group is that which we have termed "idiopathic," inasmuch as the morbid action begins in the brain itself irrespective of any malign action in the general system. The immediate causes of this type of insanity are spoken of as "moral"—grief, anxiety, and above all worry — producing over-excitation of the nervous elements of the brain, in contra-distinction to "physical" causes. Later on we hope to show that these "moral" causes are, in fact, "physical" causes of mental breakdown. This group presents a wide variety of mental type, including cases so outwardly dissimilar that they are indicated by the familiar clinical classification of "mania," "melancholia," and "dementia." In these cases, however, the widely divergent mental conditions appear to be symptoms of morbid processes which, although no doubt subject to certain variations, are substantially the same. They appear to arise from over-excitation and subsequent exhaustion and degeneration of the brain tissues. In most instances the initial symptoms are of common character, and the mental symptoms (mania, melancholia, and dementia) may present themselves in succession in individual cases.

In all cases of disease (using the term in its widest acceptation), whatever be their nature or origin, the effect upon the mental functions consists of a change of character, affecting more or less the moral and intellectual character of the individual, which persists while he is under the morbid influence. The disease may end in complete recovery and leave the mental functions unimpaired, or it may end in their all but total destruction, or in death; but in many instances, when the morbid process terminates, it leaves behind it brain lesions of a more or less serious character which manifest themselves in permanent mental change. Such terminative cases vary indefinitely in their severity and mental character. The majority of them form those marked cases of chronic insanity which are so common in our asylums; while in some the mental effect is so difficult to discriminate from ordinary conditions that, if we did not know the precise history of the subjects, we should scarcely suspect the existence of the insane element. Even in such cases, however, when we know the history we have rarely any difficulty as to their nature.

Distinct from the groups of diseases in which the mental phenomena spring directly from a morbid action that affects and alters mental functions hitherto normal, we find a large class of cases in which the morbid action has either been coincident with the commencement of life, or has taken effect before the full development of the brain and its mental functions. In such cases we may either have the brain development arrested and distorted at an early stage, so that the individual remains permanently on a lower mental platform; or, if the conformation of the brain has not been visibly arrested, we have the morbid influence showing its effects throughout life, either in peculiarities that mark him off as a morbid variety of the species, or in a constitutional weakness that is continually rendering the brain susceptible to the action of disease. In such cases we are justified in inferring defects in the delicate constituents of the brain.

In some respects the residua of the diseases accompanied with insanity present phenomena analogous to this congenital class; but they differ from them in many important points. The secondary results that follow each type of disease often present many striking peculiarities; but even when these secondary results have gone the length of dementia, it is better to view them in connection with the diseases from which they have originated.

The cases comprised in this congenital class present many varieties, both pathological and psychological; and for medical purposes it might be necessary to break them up into many subgroups. But there are common features, from the legal point of view, that make it desirable to keep them together as closely as possible, and to sever them pretty sharply from those already referred to. That a sense of the wide practical distinction between them has always been present, both in the common intelligence and in law, is testified by the ordinary division of the insane into idiots and lunatics, which in one form or other is found in almost every language and system of law. In these classes are to be found nearly all the cases which have proved most obscure and puzzling in their legal aspects, and it may be added nearly all those in which the differences of skilled witnesses have tended to throw discredit upon medical testimony.

The reason of these difficulties is not very far to seek. The diseases, in the proper sense of the word, are marked off by a tolerably sharp line, so that a skilled medical man, although he may in some instances be puzzled as to the extent to which the mental functions are affected, can always at least affirm that the disease is present and the mind affected in consequence; but in this class there is no very distinct line to be drawn between sanity and insanity. We may not be able to affirm, and indeed it is probably not true, that the healthy shade into the morbid varieties in the sense of there being an ascending series on one side of the theoretical normal line, and a descending series on the other. There is always probably a difference in kind, and not merely in degree; but the practical result is, that there are numerous cases in which it is impossible to say with certainty, or even to guess with any degree of probability, whether we have really a morbid variety or a low specimen of a healthy type. Hence the preliminary question of all legal investigation, whether we have or have not the abnormal physical basis, is apt to be insoluble from the difficulty of discrimination.

Besides this difficulty in degree, we are met by very peculiar difficulties both in the evidence before us and, in some instances in our legal appreciation of the case, by the fact that the defect is congenital, or at least antecedent to the definite formation of character. We lose entirely the very valuable evidence derived from the change of character, which is the initial symptom of the acquired insanities. In fact, we lose altogether what is justly regarded from the psychological point of view as the best criterion of insanity—the comparison of a man with his own healthy condition, and we are thrown back upon the much vaguer and more complicated process of comparing him with some theoretical and non-existent standard of normal humanity. Further, it is not merely the psychology of the case that may become anthropological instead of individual. When disease falls on a previously healthy subject, we have a physical as well as a psychical history, which is generally within our reach, and which, like the mental symptoms, helps us to mark the departure from sane life; but in these cases, even when the insanity has started from a definite ascertained cause, that cause may lie so far back in life that evidence of it is unattainable, or it may lie in hereditary antecedents, which, of all kinds of evidence, is the least certain and satisfactory.

Not only are the physical signs thus remote in time, but they are far more uncertain in character. Except in the extreme cases, which really present no difficulty, they consist in such malformations or morphological peculiarities as may indeed suggest to the physician, through analogy, that the mental anomalies are connected with a morbid physical basis, but which can scarcely be proved to the satisfaction of those who are not themselves capable of independent judgment on the subject. In short, in all cases in which the mental disturbance is not very obvious, there is the greatest difficulty in proving that it is a case of morbid origin at all; and, even if we could do so, the varieties and anomalies of such cases are so numerous that each must be judged of very much by itself, and we cannot, as in cases of disease, throw much light on it by our medical observation of cases of the same character.

The causes to which we trace cases of arrested or morbid development are very various. The most common and obvious are injuries or diseases affecting the brain during the earlier years of childhood. Injuries during birth are also a well-known source; and before birth a whole series of malign influences may affect the child through the organisms of the parents. Such causes, for example, are severe nervous shocks during the early months of pregnancy, anæmia or general unhealthy conditions, the toxines of disease, and alcoholic or other poisons; but most of the causes, and often the most important, are those which lie further back, and are to be sought for, not merely in the parents, but even in remoter antecedents. These causes are of so much consequence and so closely connected with the most difficult cases that they require more extended examination.

It is well known that morbid conditions in parents may pass by inheritance to their children. Gout, rheumatism, diabetes, hæmophilia, all the neuroses, are familiar examples; and as regards tuberculosis we may safely say that the children of tuberculous parents are apt to show a bodily conformation expressive of a tendency to the future development of tubercle. In relation to the nervous system, we have a whole series of diseases and morbid conditions which are either directly reproductive of similar conditions in the ancestors, or the effects of some ancestral morbid influence appearing perhaps in a varied or intensified form.

It would not be easy to enumerate all the antecedents from which this morbid influence originally springs, and still less so to state their mode of operation. Some of them are marked enough, such as the existence of actual nervous disease in one or both of the parents, which may however be chiefly important as indicating a more general underlying condition. But beyond these specially marked causes there is an immense number of more general conditions, which tend to produce states of nervous degeneration, with which we are sufficiently familiar, though we may be ignorant of their precise character and method of action.

There are also general conditions and habits of life which affect nutrition, and thus impair the whole organism; and besides these, such causes as excessive or long continued emotion, mental worry, dissipation and excess, specially affect the nervous system by over-excitement, irritation, and exhaustion. All these are acknowledged predisposing causes to actual nervous disease, or which at all events conduce to a condition of degeneration characterised by a general unstable condition of the nervous system.

Conditions thus acquired by the parents may be transmitted in various forms to their descendants, in whom perhaps they may appear for the first time in a thoroughly characteristic form: they may be preserved and intensified through generations, breaking out sometimes in one form and sometimes in another; and they may produce a complete or partial arrest of development, not only in the nervous system but in other parts of the organism. Further, instead of producing any defect in structure, the result may consist in what is generally called the neuropathic diathesis, a term which implies a degenerate condition of nerve substance or structure somewhat akin to the conditions of the parent from whom it springs.

The first of these classes or types with which we are concerned is the well-known one of idiots and imbeciles, characterised by an actual arrest of the brain development and a consequent restriction of the brain functions to a lower sphere. On the mental side this class presents an infinite variety of degree, proceeding upwards from an entire absence of intelligence, through imbeciles and weak-minded persons, to cases scarcely distinguishable from mere stupidity. Running parallel to the mental defect we find a series of brain malformations, all presenting the same characteristic of arrested development or defect, sometimes in the size of the brain, sometimes in its structure: and beyond the brain and the nervous system we find malformations and defective structure in other parts of the organism proceeding from the same common cause. In the cases more nearly approaching the normal line we may lose sight of these physical signs; but the cases on the mental side shade so imperceptibly into each other, that we are driven to believe that in many instances the apparent absence of the physical signs arises merely from our inability to detect them.

This nervous diathesis may appear in two forms, whether at bottom the same or materially different we do not know, and which sometimes appear separately and sometimes in combination. It may present itself in the form of what is strictly called hereditary predisposition, a mere liability to break down into forms of actual disease, in circumstances which would not affect a person of originally healthy constitution, just as the tuberculous diathesis may exhibit itself in a liability to such diseases as phthisis; or it may appear not, or not merely, in this tendency to disease, but in the form of irregular and abnormally defective nervous action. The whole nervous system may tend to react against external impressions with a suddenness and irregularity that denotes a departure from the healthy normal condition. Perhaps the degeneration may show more in one part of the system than in the others. We may in one case find the symptoms chiefly mental, or in other words the degeneration is shown chiefly in the higher brain; and in other cases, the symptoms may be chiefly motor or sensory, showing that the lower centres are most affected; just as when the neuropathic diathesis has resulted in disease, it may appear either as insanity, or in some part of the nervous system on which the mental functions do not depend.

The other type of congenital insanity is of a much more subtle and perplexing character. There may be no marked arrest of development, no merely negative fault in the intelligence which enables us at once to place the individual on a lower stage in virtue of actual defect; but, instead of arrested development, we have the full development attained with a difference—a morbid variety.

Neither in these cases have we the physical side very clearly exposed. The brain may exhibit neither marks of disease nor defective structure. There may be no serious malformation of other parts of the body. If we wish to find signs of degeneration we must seek them, not in visible deformities of form and structure, but in abnormal or perverted functions of other parts of the nervous system. We may trace these cases, in almost every instance, to inheritance; and, keeping in view what we have said of the neuropathic diathesis, it is not difficult to trace the general character of their mental features. Feeling and passion are quickly and often irregularly excited; the association of ideas is rapid and often eccentric; the power of attention and concentration small; what may pass for perseverance and attention is often the persistent impulsive sway of some dominant idea. In short, we have a mental character essentially corresponding to the impulsive, weak, and irregular character of the nervous system.

The different character of these two types of mental unsoundness is clearly marked by their extreme points on either side. The lowest extreme of mere defect is shown in deep persistent apathy, both intellectual and emotional. The other extreme of the hereditary unstable type is marked by the greatest intensity and irregularity of feeling and action. At the highest extreme of the imbecile class we are occasionally puzzled to say whether there is any morbid mental defect, or whether the case ought merely to be called one of ordinary stupidity. The extreme of the other class is never by any chance brought into comparison with stupidity, but allies itself rather to persons of passionate temper, high nervous excitability, and quick eccentric intellect.

Although we represent these as two separate types of the same great class, we often find them in combination, or at least we often find cases which it is impossible to place clearly under the one or the other, and it is obvious that this is precisely what we should expect to find. The causes that produce the degenerate condition of nerve substance are also the causes that lead to arrested development, and therefore, in all extreme cases of nervous instability, it is at least probable that there exists some defect in development, though perhaps so occult as not to be easily detected. This coincides exactly with what we observe on the mental side. It is possible, indeed, that we may find cases marked by eccentricity and violence of feeling and action, in which we can detect no trace of intellectual defect; but, on the other hand, there are numerous instances in which the two occur in a very conspicuous manner; and it is at least probable, that in nearly all the cases when the defect is most conspicuous on the moral and emotional side, there is some co-existing defect of intelligence which is partly veiled by the more prominent symptoms. It must be remembered also that although, for the sake of clearness, we have severed this class from what we have called disease in the stricter sense of the word, there are close links of connection between the two classes, and that there are cases which seem to belong equally to each. A hereditary case may break down into forms of disease, and yet it may present some peculiarities which are due to its hereditary character; and on the other hand a process of slow degeneration, based upon hereditary antecedents, may come to be analogous if not identical with the morbid process of disease acting in a healthy individual.

It is in these hereditary and defective cases that we reach what may most strictly be called the borderland of insanity. They shade so imperceptibly into those of health, that discrimination must in some instances be an altogether impossible task; and, besides, they are often veiled by a multitude of psychical peculiarities, acquired through life by the natural operation of circumstances aiding and developing their originally defective characters. Perfectly healthy men may become eccentric and depraved under the force of outward circumstances, and a morbid character may travel by the same road and present very much the same outward character, so that it is only by a very minute examination indeed that we are able to detect the original morbid influence.

The diseases and defects of which insanity is a symptom thus resemble in their variety those which affect the other bodily functions; but they are more obscure, more inaccessible to observation, and, owing to the complicated nature of the brain functions, present far greater diversity of character in the individual cases. They differ greatly from each other in point of gravity and persistence; and if we were to take the cases in a mass we should be obliged to say that they passed imperceptibly into the normal conditions of sanity; just as taking the whole mass of bodily diseases and defects together we should be obliged to say that there was no practical line of demarcation between disease and health. The case, however, becomes different when we break them up into groups. Most of the diseases properly so called are quite well marked, and can never be confused with states of mental health. In other groups cases may occur of so slight a character as to make it doubtful whether they are worth legal consideration; while in the congenital and hereditary classes we meet with cases in which it is quite uncertain whether the mental phenomena are due to disease at all. The boundary line of insanity must thus be conceived as somewhat broken and irregular, in some or indeed in most parts quite sharply marked, in other parts passing almost imperceptibly into sanity. The vast majority of cases present no difficulty to the skilled physician, nor is there any room for difference of opinion about them. The difficulty of discrimination arises entirely in certain classes, which therefore ought to be looked to with special vigilance, but which ought not to be permitted on that account to throw suspicion upon other classes of cases, about which there is no reasonable ground for doubt. The difficulty of determining the limits of insanity is thus confined to certain species of cases; and even with regard to these, if their nature is understood and the evidence in support of them intelligently examined, there is no real ground for apprehending that they may be so stretched as to cover cases which do not properly belong to them. Cases undoubtedly do arise which are practically insoluble, in which we cannot determine with certainty whether the mental peculiarities are morbid or healthy; but the prominence which these have acquired by their difficulty and interest has given them an exaggerated importance. At the most they simply represent that narrow margin of difficulty which we find in every class of cases which have to be proved by obscure and complicated evidence. On either side the mass of cases is clear, but there is always a doubtful line when the evidence is not clear and we are obliged to have recourse to presumptions. The mere existence of such a doubtful territory is no reason whatever for withdrawing the definition of insanity far within its limits. The real danger (probably at all times greatly exaggerated) which affected the administration of the criminal law lay in vague descriptions and theories of insanity being presented to juries who were too ignorant to appreciate their value, and who might readily apply them to any case which seemed at all peculiar, or in which they might not be inclined to convict. The remedy for such cases lies in a closer and more skilled examination of the evidence, and not in the maintenance of a definition which solves the question by simply excluding all cases in which there is the slightest difficulty.

CLINICAL RECORDS.

NOTES OF A CASE OF TRAUMATIC HÆMATORRACHIS OF THE UPPER DORSAL REGION.

By Alexander Miles, M.D., F.R.C.S.Ed., *Surgeon to Leith Hospital, Assistant Surgeon, Royal Infirmary, Edinburgh*; and J. C. Carr, M.B., Ch.B.Ed., *formerly House Surgeon, Leith Hospital.*

The points of interest to which we desire to draw special attention in the following case are—(1) *The lesion, and the way in which it was produced.*—As a result of the sudden muscular effort involved in heaving a sack of grain from his back, the patient sustained a partial and temporary separation of the bodies of the fifth and sixth cervical vertebræ. The blood effused from the torn vessels gravitated down the spinal canal, outside the dura, and collected opposite the arches of the first and second dorsal vertebræ. (2) *The time and mode of onset of the symptoms.*—It was not until about twenty-four hours after the injury was sustained that the patient exhibited symptoms referable to the extradural hæmorrhage. Then symptoms of *paralysis* came on somewhat *suddenly*, and were not preceded by irritative phenomena—muscular cramps, or jerkings, shooting pains and hyperæsthesia—such as usually occur in cases of "gravitation paraplegia." Further, the legs were more completely paralysed than the arms. (3) The characteristic attitude of the upper extremities, as an aid in the localisation of the lesion. (4) The fatal issue of the case, in spite of the fact that the cause of the pressure was successfully removed by operation within forty-two hours of the onset of symptoms.

Clinical Report.—Francis R., æt. 36, a dock labourer, was admitted to Leith Hospital on Saturday, 6th October 1900, at 10 A.M. The *history* he gave was that on Friday, October 5, at 4 P.M., while engaged at his customary work at the docks, he was heaving a heavy sack over his shoulders, and whilst doing so he felt a jerk, as of something giving way, "right in between the shoulders." After this his back was painful, but he went on with his work till 5 o'clock. During the night he slept fairly well, but on the following morning was unable to go to his work on account of stiffness and pain between the shoulders. When he coughed there was a sensation "like a shock of a galvanic battery" from the place in the back where he was hurt, down the spine and legs to the toes. He walked a distance of about half a mile to the hospital, which he reached at 10 o'clock on the morning of Saturday, 6th October.

On admission it was observed that he kept the dorsal and cervical regions of the spine rigid. To turn his head he rotated the shoulders, and on stooping forwards there was no bending of the spine in this region. There was tenderness over the upper two or three dorsal spines, but no undue projection of any part of the spinal column could be detected.

He walked up two flights of stairs to the ward, and at 4 P.M. he had a warm bath. A little before 5 P.M. he coughed, and felt the same galvanic pain that he had experienced before. The pain was soon followed by a sensation of numbness, and total inability to move the lower limbs. He felt the pain and numbness over the whole body.

The upper extremities could be moved with difficulty, and the range of movement was much restricted. The exact muscles which were paralysed were unfortunately not noted, but the limbs assumed the attitude which is characteristic of lesions of the first dorsal segment: the upper arm was slightly abducted at the shoulder, the elbow was acutely flexed, the forearm lay across the thorax in a position of semi-pronation, and the fingers were slightly flexed.

The lower limbs were completely paralysed. Respiration was entirely diaphragmatic, the thoracic and abdominal muscles remaining passive. There was no hiccough. Sensation was entirely lost below the level of the third rib at its junction with the sternum, and also partially down the inner sides of the arms. He had no feeling in the intestines. The knee-jerks were absent. There was retention of urine. Pulse, 60 per minute, full and strong. Temperature, 102° F. Respirations, 16 to 20.

On Sunday, the 7th, the lower limbs were still paralysed. The right limb lay with the foot everted, and, when dropped on to the bed from a short distance, it fell more limply than the left. The condition of the arms and fingers was the same as before. The area of anæsthesia had not altered, except that when touched on the inner side of the right thigh he referred the sensation to the knee. He also felt being touched in the left iliac region. On this day he felt "as though he had lower limbs," and the feeling of numbness was not so marked. The urine was pale in colour, with a thin cloud of phosphates in suspension, and a deposit of mucus. There was no albumin or sugar.

The abdomen gradually became tumid and tympanitic all over, owing to general distension of the bowel with gas. The bowels moved in the course of the morning. By 6 o'clock in the evening the abdominal distension had greatly increased, so much so that the abdomen became quite tense and drum-like. The breathing was still diaphragmatic and laboured, at the rate of 32 respirations per minute; the pulse rate was 96, and the temperature 102°·6 F. There was some mucus in the trachea, which the patient had difficulty in expelling, and every now and then, on attempting to cough, he became considerably cyanosed about the lips and face. There was still pain in the same position in the back, and tenderness over the upper two or three dorsal spines. He lay most comfortably when his head was well supported by pillows.

Towards evening the abdominal distension became very aggravated, so much so that, as the pressure on the diaphragm was seriously impeding his respiration, the question of aspiration of the intestine was considered. A turpentine enema was administered at 5.30 P.M., with very slight result. Following the enema a glass tube was inserted into the rectum, and a little flatus escaped. After this the abdominal condition was slightly relieved. Later on a weak turpentine stupe was applied to the abdomen for a few minutes, and peppermint water given by the mouth. On account of the slight improvement in the condition, no further measures were taken.

On the morning of Monday, the 8th, the abdomen was still much distended, although he had passed small amounts of flatus per rectum. The areas of anæsthesia and paralysis were the same. The pupils were contracted. The breathing remained diaphragmatic, 46 to 52 per minute. The pulse rate was 110, and the temperature 103°·6 F.

Diagnosis.—Taking into consideration the fact that the paralysis appeared suddenly, and that an interval of more than twenty-four hours elapsed before its onset, a hæmorrhage, either extradural or into the substance of the cord, was suspected. The site of the lesion was concluded to be at the level of the seventh cervical or first dorsal vertebra. This conclusion was arrived at from the condition of paralysis of the lower limbs, thoracic, and abdominal muscles, and from the distribution of the anæsthesia over the trunk, lower limbs, and inner sides of the arms, the upper limit of the anæsthesia corresponding to the sensory area supplied from the first dorsal root. The attitude of the arms also pointed to the upper dorsal region.

After consultation with Dr. William Elder and Dr. Stuart Fowler it was decided to operate, in the hope of being able to relieve the pressure on the cord.

Operation.—Chloroform was administered, the patient taking it without difficulty. On becoming anæsthetised he was placed in the prone position. A mesial vertical incision was made, exposing the spines of the seventh cervical and first dorsal vertebræ. The spines of these were clipped away with bone forceps. The laminæ were then partially sawn through with Macewen's saw, and the division completed with bone forceps. On their removal a clot was found, in shape and size like the bowl of a dessert-spoon, lying between the dura mater and the bone. This clot was removed. It was remarked that after the removal of the clot the cyanosis of the face became less noticeable. There was considerable venous bleeding from vessels between the dura mater and the bone in front of the cord. On lifting the cord away from the anterior wall of the spinal canal the bleeding increased, but diminished again when the cord was replaced. The cavity was then filled with iodoform gauze, the wound was partially closed with horsehair sutures, and the patient put back to bed, lying on his back.

On coming out of chloroform the patient talked incoherently, but never completely regained consciousness. The head was kept firmly retracted, tough mucus collected in the trachea, the breathing became more and more laboured, and there was marked cyanosis. With a view to relieving the diaphragm of pressure from the abdominal pressure, as this seemed to be embarrassing the respiration, the head of the bed was raised, but this did not appear to have any beneficial effect. The pulse rate rose to 124, the respiration to 52, and the temperature to 105°·4 F. Mucus collected in the air passages, and respiration ceased at 8.25 P.M. on Monday, 8th October. The pulse continued to beat for some minutes after the cessation of respiration.

On post-mortem examination it was found that the bodies of the fifth and sixth cervical vertebræ had been separated from one another, without being displaced. The articular processes were intact. Blood had passed down between the dura and the bone, and collected opposite the arches of the first and second dorsal vertebræ. There had been no fresh bleeding after the operation. The cord and the membranes were intact. The intestines were greatly distended with gas.

NOTES OF A CASE OF HÆMORRHAGIC PERICARDITIS ASSOCIATED WITH THE PRESENCE OF BACILLUS COLI COMMUNIS; PARACENTESIS; RECOVERY.

By WILLIAM STEWART, M.D., F.R.C.S.Ed., *Surgeon to Leith Hospital.*

CASE.—Mary M., æt. 10, was seized with pain in the right side of the chest on *September* 16, and was confined to bed. On the 18th she had pain in the calf of her left leg, and a further access of pain in the right side of the chest; she was first seen by the writer on the 19*th September*, when she was found to be suffering from acute pain in the right side accompanied with a catch in the breathing. There was comparative dulness over the right side of the chest in front, from the level of the nipple downwards, and over this area the breathing was almost tubular in character. There was no increase in the vocal resonance, and no cough. Pleuritic friction could be detected at the side of the chest. Temperature, 103° F.; pulse, 140; respirations, 60, shallow.

September 20.—Temperature, 102°·4 F.; pulse, 150; respirations, 70. Dulness rather increased but has not extended to posterior aspect. Bronchial breathing not so well marked, nor is the friction so distinct. Heart sounds normal.

September 21.—Temperature, 102° F.; pulse, 150; respirations, 70. Complains of pain over left side in the mammary line. Respirations shallow and irregular. Patient has a distressed look. The dulness in the right side has disappeared, except immediately to the right of the sternum where the percussion note is impaired. There is now no pain in the right side. A soft systolic mitral murmur is now observed for the first time.

September 22.—Temperature, 102°·4 F.; pulse, 150; respirations, 76. Has had a distressed restless night, with difficult breathing, and pain over præcordia. The cardiac dulness is increased and a to-and-fro pericardial rub is heard at the base of the heart.

September 23.—Temperature, 101°·8 F.; pulse, 150; respirations, 76. Had to sit up in bed owing to the difficulty of breathing. The cardiac dulness now extends from the upper margin of the second rib downwards, till it merges with the liver dulness, which reaches further downwards than usual; and on the right side the dulness extends 1½ in. beyond the middle line, and is well marked in the fifth right interspace. No friction to be heard, a soft systolic murmur in the mitral area. In the evening she was found to be in a very distressed condition, with orthopnœa and shallow irregular respirations, 80 in the minute, and an irregular pulse of 160.

September 24.—Temperature, 101° F.; pulse, 150; respirations, 75. In the same condition as last night, except that the dulness on the right side has crept in ½ in. nearer the middle line, and that there is now œdema over the præcordia, and bulging of the interspaces.

The smallest needle of the aspirator was introduced in the fourth interspace, 1¾ in. from the left margin of the sternum. The trocar was withdrawn immediately after penetrating, and the cannula pushed on; it met with no resistance, and had no pulsation imparted to it. On turning the stop-cock a stream of serum, so deeply stained with blood as to resemble in appearance pure blood, flowed into the bottle; after 5 oz. had been removed the needle was withdrawn. The blood almost immediately coagulated into a solid clot. The colour of the blood drawn off was neither that of venous nor of arterial blood. The child, though alarmed and excited, did not suffer from the operation, but was easier immediately, and had a fuller and more regular pulse, and deeper respirations. The cardiac dulness was at once percussed out and found to be nearly normal in size. There was also to-and-fro pericardial friction again to be heard. Dr. Mill kindly assisted me and verified the physical signs both before and after the operation. The needle and the rubber tube had been, immediately before using, soaked in a strong solution of lysol, and the bottle washed out with the same solution; the glass stopper was at once put in, and not removed until the bottle reached the laboratory of the Royal College of Physicians, from which the report was received that the blood on culture gave a pure growth of *Bacillus coli communis.*

September 24.—Temperature, 100° F.; pulse, 120; respirations, 60. Improving. Cardiac dulness same as after the paracentesis, and friction murmur the same. For the next two days she remained in much the same condition, with pericardial friction murmur heard, sometimes best at base of heart and sometimes best over the left costal cartilages on a level with the xiphoid. On *September* 28, her temperature rose a little; she was more uneasy, and dulness was noticed in the right fifth interspace. On the next day, however, her temperature fell, and the dulness in the right fifth interspace was not so marked. The to-and-fro friction at the base persisted for four or five days longer, and then was gradually superseded by a loud systolic mitral murmur. The progress was uninterrupted, and by the end of October the child was able to go about. There is at present no increase in the cardiac dulness, but the systolic mitral murmur still remains.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

◆

Diseases of the Ear: A Text-Book for Practitioners and Students of Medicine. By E. A. Dench, M.D. Third Edition, Revised and Enlarged. New York and London: D. Appleton & Co. 1903.

During recent years the surgery of middle ear disease, more particularly that form which is associated with the chronic suppurative processes, has made so many advances that the author of this book has found it necessary to thoroughly revise and enlarge his previous work on the subject. From time to time Dr. Dench has published the results of his ripe experience as an aural surgeon, and while the present volume is largely based upon his own views and methods of practice, it shows also a thorough knowledge of the work of others. In the new edition there are nearly seven hundred pages, and when we consider that these are devoted to the study of ear disease alone, we cannot help wondering how many volumes would have been occupied by a study of the affections of the nose and larynx if dealt with in the same elaborate manner. We do not refer to this point in a spirit of carping criticism, but merely to emphasise the great advances which have been made in our knowledge of the diseases of this region of the body, and the enormous amount of literature which has been published.

Dr. Dench's text-book is recognised as a standard work upon the subject, and may doubtless be accepted as an expression of the views at present held by aural surgeons in the United States. We turn, therefore, with special interest to a perusal of the pages which deal with some of the more vexed points in aural therapeutics. For instance, we find that the author in dealing with the question of electrolysis in chronic cases of Eustachian obstruction—a method which has been advocated recently in America—expresses some doubt as to whether the results which follow its employment are any more permanent than those which are produced by the use of the simple bougie. In the treatment of chronic hyper-plastic middle ear catarrh, vibratory massage is not regarded with any great favour, the author indeed having convinced himself of its detrimental effects in quite a number of cases. The operations for the removal of the ossicles are described in considerable detail, and in our opinion this section is a valuable one, being evidently based upon considerable personal experience. The illustrations accompanying this part of the book appear to us to be of very little practical value. In the chapter upon the mastoid operation, it is interesting to learn that Dr. Dench has carried out immediate grafting of the bony cavity by large Thiersch grafts and with very good success.

Space prevents us from entering into further detail, and we must conclude our review by congratulating the author upon the successful production of an eminently practical text-book.

A. Logan Turner.

A Manual of Medicine. Edited by W. H. Allchin. Vol. v. "Diseases of the Abdominal Organs." London: Macmillan & Co. Ltd. 1903.

This new volume fully maintains the excellent standard set by the previous ones. The work is distributed among various writers, but the editor is responsible for the largest individual share. He writes a long introductory article on the anatomy and physiology of the digestive organs, and also describes the normal anatomy and physiology of the liver as well as the general symptomatology of hepatic disease. In addition, he contributes the important sections comprising the diseases of the stomach, intestines, and pancreas. The physical examination of the stomach and intestines and the analysis of the gastric contents is in the hands of Dr. B. E. Dawson. Dr. Robert Hutchison contributes an article on food and diet, while Dr. Lazarus Barlow writes on the bacteria of the alimentary canal, and also describes the morbid anatomy of the liver. The diseases of the mouth, pharynx, and œsophagus are by Dr. Bertram Abrahams, who is also jointly responsible with Dr. Sidney Coupland for the diseases of the ductless glands. The diseases of the liver are divided between Drs. Hebb and Crombie, and the latter also writes about sprue and hill diarrhœa. The important section dealing with the diseases of the kidney is undertaken by Dr. Rose Bradford, while Dr. Hale White has written about the morbid conditions of the peritoneum. Finally, Dr. J. H. Bryant describes the affections of the abdominal blood vessels in an excellent article, apparently largely based upon the records of Guy's Hospital.

The general arrangement of the book is very satisfactory, and overlapping has been almost completely avoided. The plan of commencing the description of each organ with a fairly complete description of the anatomy and physiology is excellent and likely to prove very useful to students. The pathological descriptions are unusually full, and several illustrations from Ziegler have been reproduced, while there is a good coloured plate showing some of the more common forms of intestinal germs.

Transactions of the Clinical Society of London. Vol. xxxvi. London: Longmans, Green & Co. 1903.

The papers read in 1902–3 seem to have been of more than average interest. The first and longest article is by Alexander Francis, on the nasal treatment of asthma. He strongly advises cauterising the septum in even apparently healthy noses. He gives brief histories of 402 cases personally treated in this manner.

There is an interesting account of an unknown disease which occurred as an epidemic in Lincoln. Colonel Hatch, in his paper on hepatic abscess, insists on the danger attending aspiration of the liver. He has several times seen it induce fatal hæmorrhage. There are two papers dealing with laparotomy for perforation in typhoid fever. The surgical contributions also cover a large and varied field, ranging from the treatment of congenital dislocation of the hip to the use of paraffin injections for removing deformities and overcoming prolapse of the bowel and uterus. The clinical cases shown to the Society illustrated many of the rarer clinical types.

F. J. Charteris.

Modern Methods in the Surgery of Paralysis. By A. H. Tubby, M.S.Lond., F.R.C.S.; and Robert Jones, F.R.C.S.Ed. London: Macmillan & Co. Limited. 1903.

In the work before us the authors record their experience in the newer procedures, such as muscle-grafting, tendon-transplantation, and arthrodesis, which have been practised for the relief of deformities resulting from various forms of paralysis. The first section, which accounts for nearly two-thirds of the volume, is devoted to the effects of infantile paralysis (acute anterior poliomyelitis). After a brief *résumé* of the pathology and symptomatology of the disease, the discussion of the treatment is entered upon under the headings of (*a*) prevention, and (*b*) correction of the deformity. In the early stages,—and the authors recommend that "treatment should be commenced as early as possible after the attack,"—reliance is placed chiefly upon massage, warmth, and voluntary movements on the part of the patient, especially such movements as are calculated to bring under control any muscular tissue not completely paralysed. They cannot speak highly of electricity either in the early or later stage of the disease. In a work on orthopædics, it is refreshing to find a hearty condemnation of the "lumbersome and complicated machinery with which surgeons have loaded their unfortunate patients," and to have described instruments "which cost shillings rather than pounds," and which "any country blacksmith, aided by the local saddler, can repair, or even make."

Section II. deals with infantile spastic paralysis, and Section III. with paralysis and deformities arising from injuries and diseases of nerves, and some degenerations of the spinal cord.

The volume is well illustrated, and contains the records of numerous clinical cases, and the index, for a work of this kind, is admirably full and accurate. We can confidently recommend it as a practical summary of the most modern views on the subject with which it deals.

Alexander Miles.

An Inquiry into the Etiology and Pathology of Beriberi. By Hamilton Wright, M.S., Director of the Institute for Medical Research, Federated Malay States. London: J. & A. Churchill.

This is the first instalment of the results of an investigation into the etiology and pathology of beriberi, which is now being carried on in connection with the Institute for Medical Research in British Malaya. It treats very fully of the geography, geology, meteorology of the Peninsula, and the incidence of the disease on the various races, according to their occupations, food, and habits of life. The author proves that diet by itself is not the causative factor in beriberi, and proceeds to state his grounds for concluding that the "disease is due to a specific organism which gains entrance to the body *via* the mouth, that it develops and produces a toxine, chiefly in the pyloric end of the stomach and duodenum, and that the toxine being absorbed acts atrophically on the principal terminations of the afferent and efferent neurones."

Dr. Wright is the first who has drawn attention to a specific lesion in the early stages of the disease, consisting of inflammation, congestion, and scattered punctiform hæmorrhages in the pylorus and duodenum.

It remains to be seen whether this lesion is constant and specific. An examination of the blood in eighty-six cases was practically negative. Dr. Wright has apparently succeeded in setting up the beriberi process in monkeys. This should facilitate research. If the author has not solved the beriberi problem, he has, at least, done important preliminary work towards its solution. ANDREW DAVIDSON.

Annual Report of the Sanitary Commissioner with the Government of India for 1901. Calcutta, 1902.

THIS report is a mine of information respecting the varying incidence of disease on the different races and throughout the widely varying climates comprised within the limits of the Indian Empire. But the ore it contains does not lie on the surface. It can only be got at by much labour. An effort, however, is made in the introductory chapters to bring to the surface some of the more valuable material embedded in a formidable mass of statistics, for which the reader ought to be thankful.

It is obviously impossible, within our limits, to summarise with any advantage even the more salient facts concerning the health of India in 1901; and this is the less necessary, as those interested in Indian pathology will study the report for themselves. We notice the specially gratifying fact that enteric fever, which has been increasing to such an alarming extent during the past thirty years in the European Army of India, notwithstanding the constantly increasing attention paid to sanitation, shows at length some signs of diminishing. Unfortunately no new light is thrown either on the causes of its prevalence, or the conditions which have led to its decrease. The attempt which has been made in recent issues to give an epitome of the results of current bacteriological research, in so far as they bear on the principal diseases of India, such as plague, cholera, and dysentery, is highly praiseworthy. If the commissioner could afford more space to this part of the report it ought to prove of real value to the Indian medical officer. As it is, the information is too scrappy to be of much use. ANDREW DAVIDSON.

The Ocular Circulation. By J. HERBERT PARSONS, F.R.C.S. London: John Bale, Sons, & Danielsson Ltd. 1903.

THIS brochure consists of a series of lectures on ocular circulation. The subject is divided into four parts. The first is devoted to comparative anatomy, beginning with the lower animals up to man, the circulation in the rabbit and dog being specially dwelt upon. The second part deals with the physiology of the intracranial circulation, in which we find an elaborate exposition on the vasomotor nerve influence, and is illustrated by numerous pulse tracings. In parts three and four the relation of the intraocular to the intracranial pressure is treated together with the pathological anomalies of the ocular circulation. The text is copiously illustrated by original drawings, chiefly from preparations by Henderson, and written in a most interesting and fascinating manner. The whole work is a credit to British ophthalmology, and should be carefully perused by every ophthalmologist.

ANGUS M'GILLIVRAY.

Psychiatry: A Textbook for Students and Practitioners. By Professor E. Kræpelin. Seventh Edition. Leipzig: J. A. Barth. 1903.

Professor Kræpelin is well known as an authority on mental diseases, and his text-book is equally widely recognised, not only in his own but in other countries, as a sound and reliable work. It has had great influence in moulding current opinions, especially in the matter of classification, and this, the latest, edition will be read with much interest by all the specialists to whom it appeals. It has been completely revised; but little change has been made, so far as this volume is concerned, on the preceding edition. This first volume treats of general psychiatry. The causes, symptoms, progress, diagnosis, and treatment of mental disease in general are discussed in this order. The chief change to be noted here is the more complete account given of the manifestations of insanity. These are based on psychological principles, which are more minutely subdivided than before. He hopes by this means to get a more scientific classification of the symptoms of insanity, and of the disease itself. The chapter on treatment is specially good. Almost all the recent methods are described, and the author's experience of them given. It may be noted in this connection that he is a strenuous opponent of the use of restraint, seclusion, whether by day or night, and of alcohol in the treatment of all but a very few exceptional cases.

As the preceding edition was fully reviewed in this Journal at the time of its publication, it is not necessary to make further comment on the present one, but to congratulate the author on the popular demand for his book and to express the wish that each succeeding edition may enhance his already great reputation. James Middlemass.

NOTES ON BOOKS.

Divine Hygiene: Sanitary Science and Sanitarians of the Sacred Scriptures and Mosaic Code, by Alexander Rattray, M.D. (London: James Nisbet & Co. Ltd.). This is a most extraordinary book. Its birth dates back to 1879, when a volume entitled *Bible Hygiene by a Physician* saw the light of day. The bantling of that year has grown in twenty-four years to full-sized, rather plethoric twins. It is absolutely impossible to review a work of this kind in either a reverent or scientific spirit. The author is so prolix, and, if we may say so, quotes the scriptures, *qua* the devil, like a learned clerk; but quotes them at such a length, that one hardly knows where either you or he is. The first volume of this marvellous work contains 655, the second 748 pages of words designed to show that Moses, and through him Jehovah, whom the author regards as the same as the first-named teacher, promulgated the finest set of laws in Public Health that the world has ever seen in the pages of the Old Testament.

To give an example, here is the author's description of the characters and effects of a "most holy" incense specially set apart for the service of the sanctuary in the Tabernacle:—"The sweet-smelling savour of this incense, volatilised by heat, as it rose toward Heaven and spread over the Tabernacle and camp was no doubt mainly ceremonial, symbolic, and emblematic of God, the intercession of Christ, and synonymous of worship and prayer. Its four ingredients, as given by Moses, corresponded to the perfection and the four names of God. But no doubt it was something more than merely typical, and was a physical as well as a ceremonial agent."

This little book, *Membranous Catarrh of the Intestines: Colica Mucosa*, forms part three of Professor Noorden's series of Clinical Treatises on the Pathology and Therapy of the Disorders, Metabolism, and Nutrition, translated under the direction of Boardman Reed, and published by John Wright & Co., Bristol.

Another, a little book upon the same subject, has just been published by J. & A. Churchill, London, entitled *Muco-Membranous Entero-colitis*, and written by Maurice De Langenhagen.

In the first book Professor von Noorden has had the help of Dr. Carl Dapper, and their short note about this disease is well worth perusal by all physicians and surgeons.

Dr. Langenhagen's brochure upon the same subject is rather more full, and, as it seems to us, more practical. He lays much more stress, and that we believe rightly, upon the connection between muco-membranous colitis in women, in whom it most frequently occurs, and pre-existing diseases of the pelvic organs.

The latest contribution to the subject of the practical diagnosis and treatment of diseases of the stomach is a manual of intragastric technique by Herschell of London (Henry J. Glaisher, London, 1903). The volume is largely made up of descriptions of methods for the abstraction of the stomach contents and the local treatment of gastric disease. Solomon said that of the making of books there was no end, the same applies to modern gastric methods. There is no doubt, however, that by means of such methods as are described and illustrated in this book (nearly all of them designed for use in general practice), if properly studied by practitioners, should help them in successfully combating that most common of diseases, indigestion.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,
MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

ABDOMINAL SYMPTOMS (ABDOMINAL SYMPTOM-COMPLEX) OF DISEASES OF THE LOWER DORSAL CORD, ITS ROOTS AND NERVES.

OPPENHEIM (*Deutsche Ztschr. f. Nervenh.*, Leipzig, Bd. xxiv. Hefte 5 u. 6, S. 325) observes that interference with the function of the abdominal muscles in lesions of the cord and nerves has not hitherto received much attention, and prefaces his personal observations by a review of the literature of the subject. He was attracted to study the condition by meeting three cases in which the "abdominal symptom-complex" resulted from neuritis, or neuro-myositis—1. A male, æt. 18, suffered after enteric fever from weakness and pain in the legs and back and in the abdominal muscles, so that he could neither rise to the sitting position without the help of his hands, cough, nor strain at stool. The abdominal muscles were completely paralysed, and did not contract on coughing, etc., while straining efforts made the belly wall protrude. The abdominal reflexes were absent. Partial paralysis was still present three and a half years later; on straining and coughing, only the right external oblique contracted, the umbilicus was drawn slightly up and to the right, deviating more than 1 in. from the middle line. The reflexes were absent, and the electric excitability diminished. 2. A man, æt. 50, who had suffered from malaria in youth, had had pain in the right loin and side of abdomen for a year. The umbilicus was displaced to the left, the displacement being increased by coughing, crying, and straining, while at the same time the left half of the abdomen flattened and the right bulged forwards. The abdominal reflexes were less on the right than on the left side. 3. Man, æt. 38. Illness began with pain in the legs, back, and belly, and numbness in the umbilical region, the abdominal pain being worse on movement, and there being tenderness in the two lower left intercostal spaces. The umbilicus was displaced about 1 in. to the right of the middle line; coughing or straining caused flattening of the right and ball-like prominence of the left half of the abdomen, the navel at the same time moving towards the right. The reflexes were absent on the left side, and there was also reaction of degeneration. From these, and one or two similar cases, it seems that the various forms of multiple neuritis (post-herpetic, malarial, post-typhoid, diabetic, etc.) may affect chiefly or exclusively the abdominal muscles. The symptoms are: pain and tenderness over the lower intercostal nerves, and sometimes paræsthesia, with absence of the reflexes; deviation of the umbilicus to the sound side, and bulging of the paralysed side, especially on straining. In bad cases reaction of degeneration may be present. If the paralysis is bilateral, forcible expiratory acts are difficult or impossible, and patient cannot sit up without help of the hands.

Lesions of the cord itself are more common causes than neuritis of abdominal paralysis. Oppenheim's observations (given in detail) extend to ten cases—four of tumour, two of caries, and one each of multiple sclerosis, syphilis, poliomyelitis, and muscular dystrophy—in which the condition was present. Discussing the symptoms and their order of appearance, he comments on the dearth of observations on—(1) The abdominal reflexes, and (2) the relations of voluntary and automatic activity of the abdominal muscles in cases of total transverse lesions high up in the cord. Contradictory views are held as to the segmental and root innervation of the abdominal muscles; some holding that the rectus abdominis and external oblique are supplied by the fifth to twelfth dorsal; others that they are supplied by the eighth to twelfth only. In one case of laminectomy, Oppenheim was able to stimulate the eighth dorsal root, and got a general contraction of the external oblique and rectus. On purely clinical evidence no case of paralysis of the abdominal muscles has resulted from a lesion above the eighth dorsal. *Pain*, usually between the ninth rib and umbilicus, is an early symptom, and may precede the others by months and years. *Diminution of some or all of the abdominal reflexes* on the affected side is also early, usually preceding any *paræsthesia*, which, should it occur, generally affects the domain of the eighth to twelfth dorsal. As a rule, however, before this, the legs are affected—typically, by contralateral sensory or homolateral motor paralysis, or signs of paresis of the abdominal muscles develop. Oppenheim points out that slight *deviation of the umbilicus* may be due merely to atony from absence of the reflexes, and the atony may not, though it usually does so, go on to actual paresis. Displacement of the umbilicus does not occur in diplegia. *Irritative motor phenomena* do not occur. So long as the lesion is unilateral the paralysis is seldom complete, on account of the wide tract of cord which supplies the abdominal muscles. Though probably large muscles, like the rectus and external oblique, have to some extent a segmental innervation, there is no evidence that lesions of one root cause isolated segmental wasting of a muscle; they seem rather to cause general paresis.

In Oppenheim's experience this abdominal symptom-complex points to a lesion between the eighth and eleventh dorsal segments, although theoretically it might be caused by any affection of the fifth dorsal to the first lumbar root. *Localising value of alterations in the abdominal reflexes.*—Conclusions must be drawn with great caution, owing to the inconstancy with which these reflexes occur in healthy people. They are never, however, unequal on the two sides, under normal conditions. They may be divided for practical purposes into supra- and infra-umbilical, the former being controlled by the eighth and ninth dorsal roots, the latter by the tenth, eleventh, and twelfth.

CYCLIC ALBUMINURIA.

ELLIOTT and Hauser contribute short papers (*Med. Rec.*, N. Y., 1903, Dec. 12; *Berl. klin. Wchnschr.*, 1903, Dec. 14) on this subject, in both of which the relationship of the condition to nephritis is insisted upon. Elliott defines the disease as an albuminuria excited by the upright position, uninfluenced by diet or exercise, and usually discovered accidentally. Incipient renal disease, anæmia, etc., must be excluded, as well as other forms of transient albuminuria. He describes two cases, the main points of interest being that in both there was a family history of chronic Bright on the father's side, a previous history of infective nephritis, and the coexistence of serum- and nucleo-albuminuria. In the first case serum-albumin and nucleo-albumin were constantly present during the hours of activity; there were no casts, but a few renal cells and many cylindroids could be found. The albuminuria was uninfluenced by diet; exercise taken while lying in bed did not bring it on, while the erect attitude, even with the minimum of exertion, did so. The first sign was nucleo-albumin an hour after rising, while the maximum amount of serum-albumin was present towards 3 P.M. Systematic temperature observations showed that its curve was similar to that of the albumin, an elevation of 0·5° to 1° being noticed in the middle of the day. In the second case there was at the onset a definite attack of post-scarlatinal nephritis without œdema, but with albuminuria and casts. In three months all signs of this had gone, the only trace left being slight nucleo-albuminuria, which persisted, and gradually the case developed the typical features of cyclic albuminuria as just described, without there being any evidence of nephritis, except the occasional appearance of one or two atypical hyaline casts in the centrifuged deposit. The association of nucleo-albumin and serum-albumin in these two cases is particularly noted by the writer. Their most interesting feature, however, is the directly antecedent infective nephritis, probably in both cases glomerular, which gradually developed without remission into cyclic albuminuria. Such cases have usually been regarded as not conforming to true functional albuminuria, and have been classified separately, a distinction which Elliott does not admit. He regards functional albuminuria as the aftermath of a pre-existent (often undiscovered) glomerulitis, pointing out that functional disturbances cannot exist without some organic change (although beyond our power of observation) in the kidneys any more than in other organs. All the characteristics (intermittency, the effects of diet and exercise, etc.) of cyclic albuminuria are shared by the albuminuria of organic renal disease, and the absence of casts can no longer be claimed as a distinction since the introduction of the centrifuge, which has resulted in their frequent discovery in cases of functional albuminuria. The only peculiarity of the disease is its prolonged course and occasional spontaneous disappearance, without the development of any of the systemic indications of nephritis. This view does not necessarily imply a serious prognosis, since the disease is not active, but tends to resolution, though in 14 per cent. of Tessier's cases, followed for from nine to thirteen years, Bright's disease developed.

Hauser insists strongly on the distinction between cases in which formed elements appear, however rarely, and those in which they are not to be found; the former are nephritic processes. His paper deals mainly with etiology and treatment of the latter. In a very great number, if not all the cases, there is evidence of a previous infection or actual nephritis. He has repeatedly observed patients suffering from cyclic albuminuria in whom a slight new infection, *e.g.* tonsillitis, not only increased the albuminuria but caused the appearance of formed elements in the urine. The symptoms—anæmia, languor, headaches—resemble those of nephritis, and cannot be regarded as causal, or as directly due to tissue drain from loss of albumin. Cyclic albuminuria, accordingly, is an evidence of kidneys weakened by some infectious disease. He deprecates the usual haphazard way of leaving such cases to nature in the hope that they will resolve spontaneously, and thinks that a serious attempt should be made to cure the condition. To this end he begins by a prolonged rest cure on a milk and vegetable diet, and only after the albumin has been absent for some weeks is proteid gradually added to the diet. Limitation of fluid and energetic diaphoresis are equally harmful; free diuresis should be promoted by alkaline waters, etc. The chief point in his treatment, however, is the systematic education of the kidneys to resist the effect of bodily work in causing albuminuria. Accordingly, after the urine has been normal for a week as a result of rest in bed and a milk diet, the patient is allowed on to a sofa, then to sit up in a chair, and then by successive small daily increments he gradually takes exercise in his room, on stairs, and outside. The urine is constantly examined, and if at any time albuminuria recurs he is put back to an amount of exercise which his kidneys can easily bear, and the process of education is resumed as soon as possible. For a long time after apparent cure the urine should be examined periodically, especially after unwonted exertion. Mental worry acts unfavourably; so do menstruation and constipation. Hauser protests that this plan of treatment, tedious as it may seem, is neither pedantic nor superfluous: if care be used cases of old standing may be cured. He mentions two instances in which the usual *laissez faire* attitude had been adopted, and in which death resulted from puerporal eclampsia and granular kidney. An unreservedly good prognosis can never be given, since in any individual case there may be incurable renal mischief.

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

LECTURER ON SURGERY, SCHOOL OF MEDICINE, EDINBURGH.

RESULTS FROM PERINEAL PROSTATECTOMY.

Rochet communicated to the Société de Chirurgie de Lyon (*Ann. d. mal. d. org. genito-urin.*, Paris, December 1, 1903) the ultimate results of fourteen of his operations for enlarged prostate by the perineal route. (1) In one case in which there was an accidental perforation of the rectum made during the operation a persistent fistula resulted. In thirteen cases there was no fistula. (2) Continence was perfect in seven cases; in six there was a varying degree of feebleness of the sphincter; and in one almost complete incontinence. (3) In all the fourteen cases there was total disappearance of dysuria and pain. Micturition became perfectly normal, easy, and *complete*, without any degree of retention and without nocturnal frequency in four cases. In the other ten it was easy, but was still *incomplete*; the nocturnal frequency was considerably diminished. (4) The urine became perfectly normal in eleven cases, but remained unhealthy in three. The author has operated on other nine cases, but sufficient time has not elapsed to enable him to estimate the results.

THE ANTISEPTIC ACTION OF IODOFORM.

The observations of Heile of Breslau communicated to the German Congress of Surgery, 1903 (*Centralbl. f. Chir.*, Leipzig, 1903, No. 36), appear to reconcile the conflicting clinical and experimental evidence as to the antiseptic value of this drug. He shows that when iodoform is mixed with the normal fluids or juices of the body in the *absence* of oxygen it becomes decomposed and substances are set free which are powerfully antiseptic, destroying both staphylococci and streptococci. All the juices of the body are not equally active in decomposing the iodoform. In order of potency he places the tissues thus: liver, spleen, blood, kidney, lung, fat, brain—granulation tissue behaves like the juices of the body, and tuberculous granulation tissue is more active than other forms. The antiseptic agent set free by the decomposition is not iodine, as iodine is liberated in the presence of oxygen, and other and stronger forms of iodine, for example the tincture and strong solutions of sodium and potassium iodide, have not the same effect. Heile considers that the active antiseptic substance is the di-iodacetylene ($CHI—CHI$). This substance is very powerfully germicidal, and is neutralised by being oxidised.

These experimental observations coincide with what has been observed clinically, as iodoform has long been recognised to act most beneficially in cavities, while its antiseptic action in open wounds is very slight. In internal organs also, such as the liver and kidneys, the decomposition products of iodoform may act so powerfully as to cauterise the tissues. (On this hypothesis also the beneficial effects of iodoform injected into the veins in phthisis may be explained.)

THE DANGERS OF THE TRENDELENBURG POSITION.

KRASKE (*Centralbl. f. Chir.*, Leipzig, 1903, No. 36) draws attention to certain risks attending the employment of the Trendelenberg position in abdominal and pelvic surgery, particularly in cases of myocarditis, where the hydrostatic pressure of the blood may occasion irreparable dilatation of the feeble heart. He has also seen intestinal obstruction follow operations performed in this position in two cases. Kummell, in discussing this communication, expressed doubt as to the connection between the position and the subsequent obstruction, although Trendelenberg himself admitted the possibility. Another sequel mentioned is post-operative hæmatemesis, which Kraske believes may be due to pressure of the abdominal contents on the portal vein, causing venous congestion of the gastric mucous membrane. Von Eiselsberg has also observed hæmatemesis under similar circumstances. All seem agreed that the position should not be maintained longer than is absolutely necessary.

PARAFFIN INJECTION IN THE TREATMENT OF HERNIA.

ECKSTEIN (*Centralbl. f. Chir.*, Leipzig, 1903, No. 36) recommends the injection of hard paraffin in the treatment of direct inguinal and of umbilical hernia. The paraffin forms a subcutaneous plug in front of the hernial orifice. The method is less certain in indirect inguinal hernia which may escape under the plug. Even if the process does not effect a cure it enables the patient to dispense with a truss. Persuny considers that this method should be reserved for cases in which the radical cure is contra-indicated, that it is of no value in the treatment of umbilical hernia in infants.

TEMPERATURE IN ITS RELATION TO SHOCK.

KINNAMAN (*Ann. Surg.*, Phila., December 1903) has conducted an elaborate investigation into temperature relationship existing in shock. His conclusions are that shock must not be considered as due to the lowering or exhaustion of one bodily function, but as a composite condition embracing a lowering of the blood pressure, a lowering of the respiratory act, and a marked fall in the body temperature. As shock increases in severity, the most uniform and progressive factor is the fall in temperature. In some experiments the fall in temperature was the sole cause of shock. If the temperature is maintained the respiratory rate may be increased instead of diminished, and the fall in blood pressure is greatly lessened. By raising the temperature (previously lowered by shock) the respiratory rate is increased and the blood pressure raised. The author therefore looks upon lowering of the temperature as a most important factor in causing shock, and as a prominent feature of the condition.

EXPERIMENTAL OBSERVATIONS AND EXPERIENCE IN CONDUCTION ANÆSTHESIA.

BRAUN of Leipzig (*Arch. f. klin. Chir.*, Berlin, Bd. lxxi. Heft 1) records the results of a long series of clinical observations in inducing "conduction anæsthesia." By this term he means anæsthesia induced by the interruption of the conducting power of a sensory nerve trunk and consequent loss of sensation in the peripheral distribution of the nerve. This may be brought about by injecting solutions of cocaine, eucaine, or similarly acting drugs, directly into a nerve trunk or round about it. The author has chiefly investigated the results of perineural injections.

He details a number of observations, showing that cocaine, when injected round a nerve, acts on it locally and interrupts it at the level of the injection, and follows these by other observations showing that the action of cocaine may be intensified in several ways, chiefly by injecting small doses of adrenalin along with the cocaine, or, when operating on the extremities, by applying a tourniquet to arrest the circulation in the part to be operated on.

The addition of adrenalin to solutions of cocaine intensifies the local action and diminishes the general toxic effects of cocaine very markedly, as Braun showed in a former paper. The author describes in detail his methods of making perineural injections on the upper and lower limbs, the head and neck, the penis, etc., and illustrates his descriptions by anatomical diagrams, showing how various nerves may best be reached. The areas which may be anæsthetised are those supplied by the ulnar, median, and radial nerves; by the long cutaneous nerves which pierce the deep fascia at the elbow; the internal and external popliteal and long saphenous nerves; the supraclavicular, transverse cervical, and superior laryngeal nerves; and the nerves supplying the forehead and hairy scalp.

Braun has used solutions of various drugs which act as local anæsthetics, and has found that for large nerve trunks lying under the deep fascia it is best to use a 1 per cent. solution of cocaine in sterile water, adding one or two drops of 1 in 1000 adrenalin solution to each c.c. of solution used. For nerves lying in the subcutaneous tissue he uses a ½ per cent. solution of eucaine-β, adding one or two drops of 1 in 1000 adrenalin solution to every 10 c.c. of solution used. He is of opinion that the quantity of 1 in 1000 adrenalin solution injected should never exceed five drops.

The time necessary for the solutions to act varies, and where large nerve trunks are being treated may be as long as half an hour. Braun therefore warns operators to arrange their time so as to begin operating half to three-quarters of an hour after making the injections. The introduction of adrenalin has largely done away with the necessity for using the tourniquet to intensify the action of cocaine when operating on the extremities. If a tourniquet is required for other reasons it should be applied immediately before beginning to operate after the limb is already anæsthetic.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

F. W. N. HAULTAIN, M.D., F.R.C.P.Ed.,

PHYSICIAN FOR DISEASES OF WOMEN, DEACONESS HOSPITAL, EDINBURGH;

AND

J. A. C. KYNOCH, M.B., F.R.C.P.Ed.,

PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, ST. ANDREWS UNIVERSITY.

The Treatment of Suppurative Disease of the Adnexa and Pelvic Connective Tissue.

Jung (*Arch. f. Gynaek.*, Berlin, Bd. lxix. Heft 1) publishes a paper on this subject. He presents statistics of 134 cases which were treated at the Greifswald Clinic. Of those 117 were operated on, and resulted in a mortality of 20 per cent. In 101 cases the focus of suppuration was intraperitoneal, in sixteen extraperitoneal. Bacteriological examination of eighty-one of the cases showed the presence of streptococci and staphylococci in 36 per cent., tubercle bacilli in 25 per cent., and gonococci in 15 per cent. In 45 per cent. of the fatal cases streptococci were found, and 92 per cent. of the deaths occurred in cases operated on by free abdominal incision. The finding of streptococci in closed pus sacs of long duration tends to disprove the theory that such purulent collections become sterile after a year, and their contents free from danger of giving rise to septic conditions of the peritoneum.

Pelvic Inflammation.

Herman (*Clin. Journ.*, London, 1903, 26th August) doubts if the gonococcus ever causes much suppuration in the Fallopian tubes. When much pus is present it is practically in all cases due to mixed infection. When pus is retained in the tubes for a considerable time the gonococci disappear. Septic infection may spread through the vagina and uterus to the tubes, without any symptoms, till the peritoneum is reached. The swelling is produced by the inflammation extending along the tubes to the ovaries, causing a rounded swelling. As both tubes are equally exposed to infection the disease is generally bilateral. Cold seems to be another cause of salpingitis, because this condition is sometimes met with in virgins, where it is difficult to account for the condition on any other hypothesis. Pelvic peritonitis, which is gonorrhœal in origin, may entirely disappear, leaving no adhesions. The danger of salpingo-oophoritis and pelvic peritonitis, when they arise from mixed infections, is that the patient may be reduced to a condition of chronic invalidism. The condition is liable to relapses, and then the only means of cure is the removal of the diseased parts. Treatment without operation consists of perfect rest, good nursing, counter-irritation, and opium to allay pain. The larger and more definite the swelling the clearer is the need for operative interference. The best time for operation is between the attacks of acute inflammation.

ABDOMINAL INCISIONS.

PFANNENSTIEL (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, Bd. xviii. Heft 4) has recently introduced a modification of Küstner's crucial incision, and which presents improvements on that procedure. Küstner is in the habit of making two different incisions at right angles to one another—the first runs transversely, and is made just above the base of the pubic hair triangle, this passes through skin and underlying fascia. The second is sagittal, passing through the linea alba into the abdomen after pulling the skin incision diagonally apart. Pfannenstiel's procedure is as follows:—The first incision is made, as is Küstner's, transversely and at the same place, but it passes through skin, superficial fascia, fat, and the linea alba. The second, at right angles to the first, goes through the rest of the parietes between the recti muscles. The importance of this modification lies in understanding the anatomical factors which tend to produce post-operative hernia. The pull of the abdominal muscles is directly outwards from the middle line, which is represented by the linea alba; hence, with a vertical incision through this line the action of the abdominal muscles constantly tends to separate the cut edges, and so widen the scar transversely. With Pfannenstiel's modification the pull of the muscles is in the line of the scar, and hence tends to bring the edges closer together. He sutures the abdominal wall in three layers—(1) Peritoneum and recti together, (2) linea alba, (3) skin. The application of this method is, however, limited. Pfannenstiel gives as indications the following—(1) Inflammatory lesions of the appendages, in which conservative operations are to be employed; (2) displacements of the uterus, in which pessary treatment fails; (3) early cases of extra-uterine pregnancy; (4) medium and small ovarian cysts and fibroid tumours. Pfannenstiel has employed this procedure in 200 cases, and only one hernia has resulted, and in this case the wound did not heal by first intention.

DILATATION OF THE CERVIX BY BOSSI'S INSTRUMENT IN CASES OF ABORTION AND LABOUR.

SCHÜRMANN (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, Bd. xviii. Heft 4) suggests that all cases recorded, in which the instrument devised by Bossi or its modification by Preiss is used, should contain information under the following heads:—(1) Age and number of labours, (2) period of pregnancy, (3) presentation, (4) length and condition of the cervix, (5) amount of dilatation of cervix, (6) indications for dilatation, (7) time and amount of dilatation, (8) are labour pains present? (9) bleeding or laceration during dilatation, (10) method of delivery of child, (11) size of child and specially its head, (12) bleeding after delivery, (13) treatment of laceration if such occurs, (14) delivery of placenta, (15) puerperium and condition of cervix, on examination after puerperium. Schürmann describes under those headings ten cases in the clinic of Dr. Orthmann. Slight lacerations occurred frequently, but are of small importance; those can be avoided by using caps sufficiently long to reach above the os internum, and by slow dilatation. In cases of abortion, the best method appears to be to first inspect the cervix, by means of a speculum, and then to fix the posterior lip of the cervix by a volsellum. The ends of the caps should lie well within the uterine cavity; in this way no "boring" lacerations are produced. In delivering by aid of those instruments, small lacerations do occur; but the question arises, how many of those were caused by delivery of the child? Schürmann regards the instruments with high degree of favour in cases of abortion occurring between fourth and sixth month, and for labours at term where rapid delivery is called for. He thinks that they should entirely take the place of Dührssen's deep incision in vaginal Cæsarean section. Finally, he prefers Preiss' modification of Bossi's instrument, because it is cheap, simple, easily sterilisable, and, owing to its peculiar construction, one has an accurate control over the amount of force necessary to overcome the resistance of the tissues without causing lacerations.

THERAPEUTICS.

UNDER THE CHARGE OF

RALPH STOCKMAN, M.D., F.R.C.P.Ed.,

PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY;

AND

FRANCIS J. CHARTERIS, M.B.,

ASSISTANT TO THE PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY.

NARCOSIS WITH SCOPOLAMINE AND MORPHIA.

AFTER having abandoned this method, Korff has modified the dosage and now publishes a series of fifty cases successfully operated on under scopolamine and morphia narcosis. These cases were not specially selected, and represent fairly enough the ordinary run of hospital operations, including, as they do, several cases of removal of carcinomatous breasts, while other conditions were tuberculous glands, bone disease, goitre, and various abdominal conditions such as hernia, gastro-enterostomy, clearing out the gall-bladder, etc. The age of the patients varied from 17 to 74. The mixture now employed by Korff is as follows:

Scopolam. hydrobrom., 0·001 grm. = $\frac{1}{60}$ gr.
Morph. hydrochlor., 0·025 grm. = $\frac{3}{8}$ gr.
Distilled water, 10 grms. = 169 minims.

This is divided into three equal portions and injected as follows: the first portion, two and a half hours before the operation; the second portion is given one and a half hours; and the last, half an hour before the operation. In these amounts neither of the drugs produce alarming symptoms. They are to a certain extent antagonistic. The pulse is most frequently affected, and there may be slight reddening of the face. The respiration is very seldom altered, and Korff has never noticed either sugar or albumin in the urine after the operation. Occasionally the tongue tends to fall back during the profound narcosis, and, if it obstructs the epiglottis, may require pulling forward of the jaw.

One great advantage of this method of inducing anæsthesia is, that the patient may be fed on light food almost up to the time of operation, while, as a rule, there is almost no vomiting, and the patient can again take nourishment soon after awaking. Usually sleep lasts for three to four hours after the operation, and thus the patient is relieved from the severe pain in the wound immediately following the operation. In only a very few of the abdominal cases was there any vomiting, and it was only of a mild type and easily checked by morphia and atropine.

The degree of anæsthesia was perfectly sufficient. Sometimes in cutting through the skin or peritoneum, or on severing large nerves, the patient makes slight protective movements, but, if left alone for a moment, he becomes quiet again. Korff, as the result of this last series of cases, thinks that this modified scopolamine-morphia narcosis is sufficiently safe and certain for most of the operations likely to occur in general practice, while it has the great advantage of dispensing with the necessity for a skilled anæsthetist.—*München. med. Wchnschr.*, 1903, No. 46.

ANTITOXINE SERUM (DUNBAR'S) IN HAY FEVER.

MACCOY reports very favourably of the effect of Dunbar's antitoxine serum in hay fever. The remedy was tried in fifteen typical cases of periodic hay fever. The treatment was begun by the local application of the serum to the nasal mucous membrane and to the eyes. One or two drops were instilled from two to four times a day into the conjunctivæ, and two to four drops were dropped in each nostril from two to six times a day. The effects of the serum were very promptly marked, and appear so permanent that the author considers that this form of treatment is the greatest advance ever made in treating hay fever. The symptoms of hay fever disappear in a few days under the serum.—*N. Y. Med. Journ.*, Nov. 21, 1903.

THERAPEUTIC EXPERIMENTS WITH FLUORESCENT SUBSTANCES.

PREVIOUS investigations have shown that fluorescent solutions in the presence of light have a striking effect on the Infusoria, especially *Paramœcium caudatum*. Thus it was found that certain fluorescent substances, which were quite inert in the dark, proved extremely active poisons for this infusorium when exposed to the rays of the sun or even to diffused daylight. Similarly, it has demonstrated that the action of all enzymes hitherto investigated is inhibited by certain fluorescent substances in the presence of light, while in the dark no such effect is obtained. In a similar fashion the ciliated epithelium of the frog is affected. Evidently the fluorescent solutions have, in the presence of light, a very general toxic action on various forms of vital phenomena. Tappeiner and Jesionek have set themselves the task of finding out whether any therapeutic use may be made of this property. They have experimented with watery solution of eosin in various skin diseases. The most suitable strength was a 5 per cent. solution. This was constantly painted on the diseased part, and kept as long as possible exposed to light. They obtained successful results with cases of cancerous ulceration, lupus, syphilis, and tuberculous ulceration of the testicle. Thus, in a woman of 70, a large, thick, soft fungating cancer of the size of a five-shilling piece was healed in sixty days, and replaced by a smooth cicatrix covered with healthy epithelium. In the surrounding tissue there are still a few spots which have not quite healed. The only treatment was painting with 5 per cent. eosin solution and exposure to the sun or to an arc light of 25 ampères. During the night the tumour was dressed with boric lotion. Towards the end of the treatment a few drops of eosin were injected into the margins of the ulcer, and this seemed to hasten the cure.

Similarly good results were obtained in other two cases of rodent ulcer and cutaneous carcinoma. The effects in five cases of lupus were interesting and showed that the lupus tissue readily succumbs to the effect of light and eosin. This is at least true for lupus granulation tissue, provided that it is not covered with epidermis. It is of the greatest importance, however, whether the lupus infiltrations are covered with epidermis or not. If the nodules are superficially placed, and the epidermis thin and tense, it rapidly disappeared under the treatment, and then the exposed nodules quickly heal. The prominent protuberant forms are specially susceptible to the eosin-light treatment. When, however, the nodules were deeply placed, and the epithelium intact and thick, the treatment had little effect. If, however, as sometimes happened, the constant painting brought on an erythematous inflammatory condition of the sound tissues, giving a general œdematous swelling, in this case the nodules seemed to share in the œdema, and subsequently became much smaller. A similar good effect in syphilitic manifestations was attained. It was noted that when the primary lesion was thus treated the secondary eruption apparently was delayed, and seemed less intense than usual. The authors' observations are interesting, and they promised to publish their results in fuller detail.—*München. med. Wchnschr.*, 1903, No. 47.

EFFECTS OF RÖNTGEN RAYS.

It has been shown by various observers that the radium rays, when brought closely into contact with young animals, rapidly cause death, under symptoms pointing to involvement of the nervous system. Heincke (*München. med. Wchnschr.*, 1903, No. 48) has repeated these observations and is able generally to confirm them. He then reinvestigated the effect of Röntgen rays, and finds that they too exert a distinct influence on small animals. Thus, white mice exposed for several days, for from two to seven hours, invariably died within six or ten days. The first symptoms are rapid emaciation, refusal of food, ruffling of the coat, and general anxiety. The animals then develop conjunctivitis and diarrhœa. There are no convulsions or symptoms of paralysis. The effects on guinea-pigs were not so constant, but even here the majority of the animals died on being exposed for seven to fourteen days. The younger animals were much more susceptible. The symptoms were the same as in the mice. If the animal lived more than ten days the skin became the seat of universal dermatitis, and then the animal died of sepsis. The only effect on rabbits was to cause dermatitis. Heincke tried to find out the exact effect of the rays by protecting the brain and spinal cord in different cases. However, he was unable to detect any difference. On the other hand, he finds that the spleen in mice is always altered. There is great disappearance of the cellular elements, but tremendous increase in pigment surrounding the Malpighian corpuscles. In all cases these latter are reduced, and in extreme cases the corpuscles may disappear entirely. Similar but less marked changes were got in the spleen of the guinea-pigs. The effect on the other organs is a negative one. Neither in the liver nor kidney is there any pigment deposited. Heincke thinks that these changes point to a great destruction of the red cells.

In connection with this action of the Röntgen rays on the spleen it is interesting to recollect that various writers have recommended the use of the Röntgen rays in leukæmia. The most recent writer is Dr. Nicholas Senn (*Med. Rec.*, N. Y., Aug. 22, 1903) who claims to have cured a case of spleno-medullary leukæmia by this means. The description of the blood condition is not very fully given, but apparently the case was a mild one, with, however, distinct changes in the red corpuscles. In addition to the spleen, the lower end of the sternum, and the epiphyseal extremities of the long bones were exposed to the rays for ten to twenty minutes daily. The spleen after three weeks was markedly reduced, and there was a corresponding improvement in the blood. Two months later the only abnormal condition of the blood was a slight anæmia, but all myelocytes and abnormal cells had disappeared.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

HARVEY LITTLEJOHN, M.A., B.Sc., M.B., F.R.C.S.Ed.,

LECTURER ON MEDICAL JURISPRUDENCE, SURGEONS' HALL, EDINBURGH.

POISONING BY ANILINE.

WRZOSEK, Horoszkiewicz, and Rzegocinski (*Friedreich's Bl. f. gerichtl. Med.*, Nurnb., 1903, Heft 5 and 6), after an exhaustive summary of the subject of aniline poisoning, proceed to give the results of experiments carried out by themselves, with the view of determining two questions as to which considerable doubt still exists, namely, its mode of action and the cause of death.

Some writers regard aniline as chiefly a blood poison, others attribute its injurious effects to an action on the nervous system, while it has been described as a heart poison, also as paralysing the respiratory centre, and again as causing death by producing thrombosis. The view which has received most acceptance is, however, that aniline is a blood poison, and that death is produced by its destructive action upon the red blood corpuscles.

The authors carried out a large number of experiments upon animals (dog, cat, rabbit, etc.), under various conditions of dosage and method of administration. The chief conclusions arrived at from their investigations are as follows:

Aniline has a toxic action on the central nervous system, in addition to being a blood poison. The proof of this is seen in acute poisoning, in which cases serious nervous symptoms appear in the course of a very short time and before any important changes can have taken place in the blood. That aniline is a blood poison, however, is proved by the destruction of the red corpuscles and the presence of met-hæmoglobin in the blood and urine, hæmoglobinuria, jaundice, and cyanosis.

Aniline acts as a poison when introduced into the system by the lungs or stomach and also through the uninjured skin. It is excreted by the urine partly unaltered and partly as paramidophenol. All the symptoms which have been observed, with the exception of those above mentioned which are produced by its action on the blood, must be attributed to changes in the central nervous system. No very characteristic anatomical changes are produced by aniline.

In acute poisoning, at any rate of animals, the cause of death is paralysis of the central nervous system.

The following case recorded by the authors indicates the extremely poisonous nature of aniline even when imbibed through the skin. A woman student placed a bottle containing about an ounce of aniline oil in the pocket of her dress on leaving the laboratory about 5 p.m. In a quarter of an hour on arrival home she noticed an unpleasant odour. On putting her hand into her pocket she found that three-quarters of the contents of the bottle had escaped, thus producing the smell she had noticed. Towards 6 o'clock she became suddenly sleepy and tired, but, as she had work to do at the Public Library, she went there at 7 o'clock, without, however, having changed her dress. She became more tired and sleepy and left the library at about 9 o'clock. In the street she felt very weak and had a sensation of compression over the heart. On arriving home she collapsed but was quite conscious. She had no headache but great fear of being made to move. On being put to bed the heart's action and respiration were found to be normal. The lips, nose, and fingers were cyanotic and almost black, the extremities were cold and she had rigors. On lifting the head there was great faintness. During the night the patient could not sleep and complained greatly of breathlessness and pains on movement.

The following day there was still great weakness and cyanosis, and well-marked yellow discoloration of the sclerotic appeared. On the third day the cyanosis disappeared but the weakness remained, and complete recovery only took place after ten days.

EXTENSIVE BRAIN LOSS, WITHOUT IMPAIRMENT OF INTELLECTUAL FACULTIES.

THE following case is of forensic interest, as showing how extensive an injury to the brain may be, without its being necessarily accompanied by unconsciousness or subsequent impairment of the intellectual faculties. A miner, æt. 40, was preparing to spring a hole with dynamite, when it exploded while his face was before the hole. His eyes were blown out, the skin and muscles and forehead were partly blown off, with the anterior portion of the skull-cap turned back over the parietal bones. The orbital plate of the frontal bone was blown into the brain, and the brains exuded through the opening into the cheek. Keate, who records the case, states that he removed from the brain twenty small stones and several pieces of bone, together with a considerable amount of dirt, most of which were deeply buried in the brain. The amount of cerebral matter which came away weighed one ounce. The patient never for one moment lost consciousness, and his mind has remained perfectly clear so that he can describe accurately the details of the accident. He complains of no pain, and locomotion is good.—*Med. Rec.*, N. Y., Oct. 17, 1903.

DEATH BY HANGING AFTER TRACHEOTOMY.

BERTELSMANN records a case of great interest in relation to the cause of death in hanging. A woman, who three months previously had had tracheotomy and removal of one half of the larynx, performed on her on account of cancer, was found dead in the bathroom of the hospital. She was seen in the corridor by the nurses fifteen minutes before, but was quite dead when found. She had hanged herself by means of a piece of string attached to a hook fixed on the wall 4½ ft. from the ground. The body was in a kneeling posture, the knees touching the ground while her hands were clasped across her breast. The ligature was placed under the chin and ran backwards beneath the angles of the lower jaw. The tracheotomy tube was in position and admitted of free access of air. The face was pale and perfectly calm.

The popular idea that death by hanging is due to occlusion of the air passages was long ago disproved. Death by hanging may occur when every interference with the air passages is excluded, the cause of death having been shown to be chiefly due to constriction of the blood vessels in the neck. Heberda and Reiner have shown that not only are the large vessels on either side of the neck compressed, thus interfering with the supply of blood to the brain, but that the vertebral arteries are also constricted at the point between the first and second vertebræ where they are unprotected by a bony canal. These writers have demonstrated that constriction of the vertebral arteries may occur even in atypical positions of the ligature, as, for example, in those cases where the knot of the ligature is situated under the chin.

The case recorded by Bertelsmann thus affords a striking illustration of the truth of the view that death from hanging may occur without there being any interference with the air supply to the lungs, and also exemplifies the fact that unconsciousness ensues with great rapidity under such circumstances. As is pointed out in the paper, unconsciousness must have occurred almost at once in the present case, since the clothes showed no disorder from struggling, the face was placid, and the hands were clasped across the breast, while the knees touched the ground so that she could easily have released herself had she suffered pain or lost confidence in the method of suicide adopted, when she found that, notwithstanding the ligature round her neck, she could breathe freely.—*Vrtljschr. f. gerichtl. Med.*, Berlin, 1903, Heft 4.

CASE OF TRANSFORMATION OF THE ENTIRE BODY INTO ADIPOCERE.

OKAMOTO of Japan reports an interesting case of transformation of the whole body into adipocere. A man who was very stout and somewhat addicted to drink died in his 71st year. The body was placed in a wooden coffin which was of small size, owing to the fact that the size of the coffin permitted, depended, in the village in question, upon the social status of the deceased. The body had therefore to be forced into the box used, so that it assumed a sitting posture, with the limbs and head flexed upon the trunk. It was buried in the middle of a rice-field where the soil was largely clay and under water for the greater part of the year.

In 1897, or forty-nine years after burial, the grave was opened in order to bury another member of the family, when, to the great surprise of everyone, the coffin was found intact and containing a large black, firm mass, which, on closer inspection, proved to be a complete corpse, transformed into adipocere, in a squatting posture. It was quite odourless, and so well preserved that, not only could the eyes, mouth, and individual toes be distinguished, but also the furrows resulting from the cords which had been used to tie the limbs together; and even the imprint on the skin, of the rice-straw which had been placed round the corpse at the time of burial, could be plainly recognised.—*Vrtljschr. f. gerichtl. Med.*, Berlin, 1903, Heft 4.

THE HYDROSTATIC TEST AND PUTREFACTION.

IN 1895, Bordas and Descoust published a paper in which, as a result of experiments, they expressed the view that the lungs of newly-born animals which have not respired do not alter in specific gravity as a result of putrefaction, and that gases of putrefaction only develop in lungs which have respired, so that the presence of gas bubbles in decomposed lungs of the newly-born is to be regarded as a proof of respiration having taken place. Later observations by Lebrun and also Ungar lent support to the above views. In further elucidation of the question Leubuscher (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1903, Bd. iv.) records the results of experiments which he carried out during the winter, spring, and summer of 1901, upon animal and also human fœtuses, which he allowed to decompose for varying periods up to three months.

In no instance, in which it was absolutely certain that no respiration had taken place, did putrefaction cause the development of gas and the lungs to become buoyant. On the other hand, in four human fœtuses in which slight attempts to respire did occur, or in which air was introduced into the lungs by artificial respiration, more or less numerous gas bubbles developed, rendering the lungs to some extent buoyant.

Leubuscher thus agrees with the statement of Bordas and Descoust, and expresses the opinion that the development in a decomposing lung of putrefactive gases, to any considerable extent, indicates that air has entered the lung either as a result of respiration or of attempted resuscitation.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF

P. M'BRIDE, M.D., F.R.C.P.Ed.,

CONSULTING SURGEON TO THE EAR AND THROAT DEPARTMENT, ROYAL INFIRMARY, EDINBURGH;

AND

A. LOGAN TURNER, M.D., F.R.C.S.Ed.,

SURGEON FOR DISEASES OF THE EAR AND THROAT, DEACONESS HOSPITAL, EDINBURGH.

An Unusual Case of Spontaneous Hæmorrhage from Both Ears.

A limited number of reported cases appears to establish the fact that hæmorrhage may occur from the ear, when the external auditory meatus and tympanic membrane are intact. Goldstein has recently published an interesting case of this kind (*Laryngoscope*, St. Louis, August 1903). Like all the other cases reported, with one exception, the patient was a woman. She was 22 years of age and of a distinctly hysterical temperament. A spontaneous, bloody discharge occurred from both ears suddenly, during convalescence from an attack of influenza. There was no previous history of trauma, there had been no ear trouble of any kind, and the hearing had always been normal. On examination a sero-sanguineous fluid was found in each meatus. When mopped away it left no stain and did not coagulate, it had a slightly alkaline reaction with litmus paper. Both tympanic membranes were intact and normal in appearance, and there was no evidence of inflammation. Subjectively, the patient complained of a sense of pressure, and occasional headache just before the exudation occurred. During the year while the patient remained under observation, the discharge occurred at irregular intervals. When the patient was under some nervous excitement it occurred more frequently and in greater quantity. Sometimes large pads of cotton wool placed over the ear would become saturated. Careful examination of the ear for twenty minutes at a time failed to reveal the source of the discharge.

The question of malingering or simulation naturally arose in connection with this case, but the author gives various reasons for excluding this exciting cause. Frequent and careful inspection of the ear failed to reveal any sign which could suggest that the ear had been tampered with. The fluid was not blood and did not coagulate. During inspection it would sometimes suddenly well up and fill the deeper part of the meatus, but it was impossible to say on any occasion where the exact area was. The fluid was usually about 1 c.c. in volume, and, after it was mopped out, there appeared to be a moist, reddish, glistening line along the posterior circumference of the membrana tympani at its junction with the meatal wall. After packing the meatus with cotton wool and sealing it up with collodion, the dressings were found saturated with the exudation. The question of vicarious menstruation and the hæmophilic diathesis were excluded in this case. In other reported cases, the source of the exudation has been either determined or been suspected in the ceruminous glands, but in this case there was never any evidence in support of such an origin. As a final attempt to cure the affection, Goldstein determined upon radical suggestive therapy, and informed his patient that an operation, followed by fixation of the head in a plaster of Paris bandage, would completely cure the condition. All the formalities were gone through, and at the time of publication, six weeks after the sham operation, there had been no recurrence of the discharge. As further evidence of the hysterical nature of the complaint it may be noted that, while during the exudation there was total deafness in one ear, it had disappeared at the time of writing.

LUMBAR PUNCTURE IN THE INTRACRANIAL COMPLICATIONS OF MIDDLE EAR INFLAMMATION.

CHAVASSE and Mahu present an elaborate article upon lumbar puncture in the diagnosis of intracranial complications of ear disease (*Ann. d. mal. de l'oreille, du larynx, etc.*, Paris, November 1903). The conclusions arrived at by these investigators are as follows:—(1) The cerebro-spinal fluid obtained by lumbar puncture when examined, as regards its appearance, bacteriology, and cellular elements is a valuable aid in the diagnosis of the intracranial complications of otitis media. When carried out without aspiration, and without a general anæsthetic, with the patient in the recumbent position, no harm results. (2) Both the positive and negative observations should be noted as well as the clinical course of the affection, and the stage of the disease at which the puncture is made. One must also bear in mind the influence of certain general diseases upon the constitution of the cerebro-spinal fluid, such as syphilis. (3) In the great majority of cases a turbid or even a clear fluid containing, after being centrifuged, micro-organisms or polynuclear leucocytes, or both these elements together, reveals the existence of meningitis of bacterial origin. A clear or a slightly turbid fluid containing mononuclear lymphocytes in great quantity indicates usually a tuberculous affection, the diagnosis of which is made still more positive if Koch's bacillus is found. The lymphocytosis is also observed in other chronic meningeal processes, where acute meningitis is subsiding and particularly in cerebro-spinal meningitis. (4) In extradural and subdural suppuration the cerebro-spinal fluid preserves its normal constitution, so long as the arachnoid space remains free from all irritation. (5) Lumbar puncture in circumscribed meningitis has up to the present not given sufficiently precise indications to permit of its being considered of diagnostic value in this affection. (6) In cerebral abscess, in thrombosis of the lateral sinus, and in serous meningitis which is not bacterial, the cerebro-spinal fluid is clear, normal, often increased in quantity, and under pressure, especially in the two last-mentioned complications. (7) Where there are symptoms suggesting an affection of the labyrinth, "labyrinthisme," or in the condition where there are meningeal symptoms without meningitis being present, "meningisme," the fluid is normal. (8) After injuries of the labyrinth, with symptoms referable to the ear, red corpuscles may be present in the cerebro-spinal fluid. (9) The facts derived from the examination of the fluid ought never to prevent surgical interference, as they, on the contrary, make our knowledge more precise and consequently of more value. (10) Up to the present time, the therapeutic value of lumbar puncture is shown to be uncertain. However, on account of the results obtained in general medicine, and in some of the cases of meningitis of otitic origin, one is right in combining it with surgical intervention in cases of meningitis, so long as the cases are not clinically hopeless. (11) It has had the advantage of demonstrating the curability of some cases of meningitis. (12) Examination of the cerebro-spinal fluid in the present state of our knowledge, especially examination of its cellular elements, has improved the means of diagnosis at our disposal, and should therefore be generally employed in cases of suspected intracranial complications of middle ear inflammation. The authors tabulate the results of their own experience based upon an examination of twenty-seven cases. The paper is an interesting one and merits perusal.

OSTEOMYELITIS OF THE SKULL WITH EMPYEMA OF THE NASAL ACCESSORY SINUSES; SINUS THROMBOSIS; PYÆMIA; DEATH; AUTOPSY.

THE case recorded by Arnold Knapp (*Arch. Ophth. and Otol.*, N. Y., 1903, No. 3) is another added to an already pretty long list of fatal cases, following operations upon the frontal sinus in the treatment of chronic suppuration. It is true that the nasal disease was very extensive, all the accessory cavities apparently containing pus, while the nose was filled with polypi causing marked displacement of the nasal bones and the nasal processes of the superior maxillæ. The patient was a young woman who had suffered from nasal obstruction and discharge for five years. Both frontal sinuses were opened through external incisions, the right sinus in the first instance, the left at a later date. The patient died six months after the first operation, and during that period the following pathological changes took place. Without giving the clinical history of the case in detail, it will be sufficient to record Knapp's summary of the main features. After removal of the nasal polypi, opening of the ethmoidal air cells and frontal sinuses, the infection apparently extended upwards in the diploë of the frontal bone, and a slowly progressive osteomyelitis invaded that structure. After some weeks subperiosteal abscesses developed over the frontal eminences, and in the temporal fossæ, and also in the vertical portion of the frontal bone as far as the coronal suture. Free incisions were made into the diploë, but there was no evidence of the septic process having involved the inner table of the bone. The squamous portion of the right temporal bone, however, was completely destroyed in a limited area, the dura mater being exposed covered with granulations. In the right suboccipital region a similar condition arose, and an epidural abscess was found over the knee of the sigmoid sinus, which was thrombosed. Pyæmic extension to the lungs took place and the patient died somewhat suddenly six months after her admission for treatment. Post-mortem examination corroborated the various clinical features just referred to, and it was interesting to note that the process had not penetrated the dura mater. This membrane was only exposed in two places beneath the frontal bone, and the deep surface of the inner table of the bone showed a honeycombed appearance only on the left side. There was no pus upon the dura. The meninges on the cortex appeared normal, but the pia mater at the base between the optic chiasma and the pons was clouded and thickened. The ventricles were distended with turbid fluid, but there was no abscess of the brain or any gross lesion. The cribriform plate was not perforated, and the dura mater at the base of the brain was normal. The right cavernous sinus was thrombosed. In the torcular the thrombus was converted into an abscess. The chronicity is an interesting feature in this case, as it is in others of a similar nature. The streptococcus was obtained from the pus in the secondary subperiosteal abscesses.

PUBLIC HEALTH.

UNDER THE CHARGE OF

J. BUCHANAN YOUNG, M.B., D.Sc. (Public Health),

ASSISTANT TO THE PROFESSOR OF PUBLIC HEALTH, UNIVERSITY OF EDINBURGH.

POLLUTION OF SOIL BY SEWAGE.

Houston (*Rep. Med. Off. Local Gov. Bd.*, 1901–02), in a further communication on the fate of sewage microbes in soil, gives in detail the results of experiments carried out by him during the last two years. He finds that the addition of sewage to ordinary garden soil produces no very marked increase in the number of sewage bacteria, but that they rapidly diminish in number in the presence of the hardier soil bacteria. When virgin sandy soil is similarly polluted, however, there is an enormous increase of the total number of bacteria as compared with that present in the soil previous to inoculation. Although the numbers rapidly diminish, it is only after some months that the soil reverts to its original state.

The addition of sewage to a soil greatly increases the number of *Bacillus coli communis* and allied forms. The relative disappearance of *B. coli* varied very much in rapidity, and periods of apparent return to activity were not unfrequently noticed, and the presence of somewhat atypical forms in the polluted soil, even after some months, was demonstrated. The absolutely typical forms disappeared more quickly than the more or less atypical forms, but, as Houston points out, it may only be that originally typical strains have, in their altered surroundings, lost some of the characters which the bacteriologist regards as positive attributes of typical *B. coli communis*. The experiments as a whole seem to indicate that if *B. coli* does not die off in the surface layers of the soil, it becomes greatly reduced in number, and that its presence in any number in a soil may be regarded as evidence of comparatively recent sewage contamination.

The presence of sewage streptococci in any number in a soil points, according to Houston, to extremely recent contamination, as their disappearance seems to be extremely rapid, although the persistence of streptococci or of pseudo-streptococci for long periods in the soil was observed on more than one occasion. The differentiation of these from the genuine sewage streptococci, he says, is a matter of difficulty, and he is not prepared as yet to "express a definite opinion regarding the points (morphological or biological) on which reliance should be placed in effecting a discrimination of the above kind."

He considers that, according to our present knowledge, his results are against the supposition, so widely held, that the surface layers of the soil are a fertile breeding-ground for organisms of a pathogenic sort, as they seem to show that some soils "heavily" polluted with excremental matter tend soon to purify themselves, "so far as the non-sporing microbes of intestinal sort (*e.g. B. coli* and streptococci) are concerned." He also points out the necessity for distinguishing between the surface layers (to which he limits his conclusions) and the deeper layers of the soil, and between *relative* and *actual* death of bacteria. From the epidemiological point of view the importance of the results lies in this, that if *B. coli* is rightly regarded as more resistant than *B. typhosus* and the bacillus of cholera, it may be inferred "that these pathogenic microbes would not be likely to maintain their vitality in the *surface* layers of soil for more than a brief period."

ADMINISTRATIVE MEASURES AGAINST TUBERCULOSIS.

NEWSHOLME (*Journ. Hyg.*, Cambridge, vol. iii. No. 4) in an important paper, read at the International Congress of Hygiene at Brussels, in September last, gives some interesting particulars as to English administrative measures against tuberculosis. He divides the measures adopted into—(1) Means of ascertaining the existence of the disease; (2) direct preventive measures (laws against indiscriminate expectoration, disinfection and cleanliness, sanatoria, and general sanitary improvements); and (3) the education of patients and of the public in the importance of the various measures.

The figures given below show the increasing advantage taken by the medical practitioners of Brighton, for which town Dr. Newsholme is medical officer of health, of the free bacteriological examination of specimens of sputum for the presence of *Bacillus tuberculosis.*

		Specimens of Sputum examined.
14 months . . .	1897–98	21
12 ,, . . .	1899	47
12 ,, . . .	1900	86
12 ,, . . .	1901	125
12 ,, . . .	1902	169
6 ,, . . .	1903	120

Under the heading of "notification" some figures are given showing the relative amount of voluntary notification secured in Brighton, Manchester, and Sheffield in the four years 1900 to 1903.

Year.	Brighton (Population in 1901, 123,478).	Manchester (Population in 1901, 543,969).	Sheffield (Population in 1901, 380,717).
1900	105	1573	585
1901	153	1339	648
1902	224	1260	739
1903	165 (6 months)	323 (3 months)	—

NOTE.—The figures for Brighton and Manchester give the number of new cases notified, for Sheffield the figures give the total number of notifications.

That the risk which a medical practitioner runs, of being accused of committing a breach of professional confidence, in voluntarily notifying a case without the consent of the patient, is felt to be a real one, is shown by the fact that notification is limited chiefly to patients of the poorer classes, and especially to those treated in public hospitals and dispensaries. This is one of the strongest arguments in favour of compulsory notification of the disease, and the city of Sheffield has recently, by a local Act, made phthisis compulsorily notifiable.

In Brighton the voluntary notification of phthisis has been in operation for over four and a half years, and the procedure following on notification is as follows: (1) The patient is visited at his home, or interviewed at the office of the medical officer of health, and the history in detail of his case noted. (2) The patient's room is cleansed and disinfected when required. This is always done on change of address, or on removal to the sanatorium, and similar measures are carried out on the death of a phthisical patient, whether previously notified or not. The disinfection consists in spraying the walls of the room and the contents of the room with formalin. If the wall paper is dirty it is stripped off, and the ceiling white-washed, the bedding, etc., removed, and disinfected by steam, and the entire room is scrubbed and washed. (3) The patient is instructed in precautionary measures, both verbally and by printed instructions, and if poor he is provided with a pocket-spittoon for outdoor use, and Japanese paper handkerchiefs for indoor use. (4) A careful inspection of each house in which a phthisical patient lives is made, and any sanitary defects are remedied. (5) If the patient is lodged under unfavourable conditions, and especially if in danger of infecting others, he is admitted for a month to the borough sanatorium, where ten beds are set apart for such patients. The period of stay in the sanatorium may be more prolonged, but, as a rule, four weeks is the length of residence, this sanatorium treatment being regarded by Dr. Newsholme more as educative than curative.

Dealing with direct preventive measures he points out that there is in England no general enactment against indiscriminate expectoration; but the Glamorgan County Council, the London County Council, Brighton, and some few other authorities have byelaws against spitting on the floors, walls, etc., of public vehicles, public waiting-rooms, or places of public entertainment. As regards disinfection and cleanliness, efficiency in this direction cannot be secured unless notification is most thorough. "To secure primary disinfection and subsequent cleanliness in every detail is the most important object of notification." General sanitary improvements have done much to diminish the death-rate from phthisis, but sanitary supervision to secure the cleansing of rooms and the abatement of overcrowding have been even more important.

Newsholme is, from his experience in Brighton, a strong advocate of the "sanatorium training of consumptive patients." He points out that, in the majority of the cases notified, the disease is so far advanced that even several months' sanatorium treatment would not effect a cure, but the admission of such patients for even a month to the sanatorium will diminish the disease and improve the public health in three ways: (1) The patient improves in health, and is enabled to start afresh with increased prospect of recovery; (2) on his removal to the sanatorium his home can be thoroughly cleaned and disinfected; and (3) when sent home he has been carefully trained to manage his expectoration, so as to be no longer a source of risk to his family and fellow-workmen. This educational part of sanatorium treatment "is more important in the public interest than its curative aspect." This he considers the best way of educating the patient. To the education of the public careful instruction is absolutely necessary. "Panic is caused by imperfect knowledge, not by properly weighed instruction." Physical training and the teaching of domestic hygiene should be insisted on in all our elementary schools, and by such measures "a much more rapid decline in the death-rate from phthisis could undoubtedly be secured."

REPORTS OF THE MEDICAL SOCIETIES.

◆

Edinburgh Medico-Chirurgical Society.—Clinical Meeting.—*January* 8, 1904.—Professor John Chiene, C.B., President, in the chair.—A discussion took place on the treatment of various cutaneous disorders by X-rays and Finsen light. Dr. Allan Jamieson, in opening the discussion, first drew attention to the fact that when structurally intact the epidermis was highly impermeable, while if diseased and therefore porous it might absorb, unduly, remedies applied to it. X-rays and Finsen light act on the tissue elements in and beneath the epidermis. In using the X-rays he had discarded the spring interruptor used on his earlier cases, and it was only on the introduction of the mercurial interruptor that he had had favourable results. It was very important to screen healthy parts from the rays, as they caused baldness, the hair, however, growing again after the treatment was stopped. The best distance at which to place the tube was from 4 to 6 inches. He usually gave six exposures, of five minutes each, on four days of the week. In eighteen months he had treated 133 cases of lupus, thirty of favus, twenty-one of rodent ulcer, twelve of sycosis, and two of mycosis fungoides. In all improvement followed, and many were cured though it was impossible to say whether cure were permanent or not, as cases discontinued attendance and so were not followed up. In using Finsen light on similar cases he found it acted best on small patches or nodules, seated over bony eminences, which permitted of the part being blanched. The process was slower and less effective than the X-rays, and caused no burns. A lamp of 18 ampères gave the best results. Some of his cases were treated by both methods. In mycosis fungoides the X-rays constituted the sole means of arrest known. As to the mode of action of the rays it was certainly not a bactericidal effect. Possibly they promoted mitosis, and in malignant cases it seemed they recalled aberrant cells to the normal; how so, was quite unknown. Drs. Norman Walker, Dawson Turner, Fraser (Dundee), and others took part in the discussion which followed.

January 20, 1904.—Professor John Chiene, C.B., President, in the chair.—The evening was devoted to a discussion on acute appendicitis, its diagnosis, and the indications for operation. Dr. William Russell, in opening the discussion, said that, while acute perityphlitis does occur without there being any involvement of the appendix, this structure is the primary cause of inflammation in 95 per cent. present of the total cases. The pain which ushers in an acute attack is probably due to a temporary embarrassment of the appendicular drainage. The pain is often referred to the umbilical or epigastric regions, or all over the abdomen, and is frequently associated with skin hyperæsthesia over these regions, and this superficial tenderness must be carefully distinguished from the deep tenderness over the appendix. The latter may only be elicited in some cases by rectal examination. The diagnosis rests upon the individual skill in eliciting the essential and distinguishing it from the non-essential or incidental. In discussing the indications for operation, Dr. Russell alluded to the two schools of opinion. The one, which he called the radical school, advises operation in all cases, however mild the symptoms may be; the other, the conservative, reserves the operation till the symptoms become urgent. The great question is, Will the appendix perforate or not? According to statistics one case in ten dies, if none are operated upon. He would advise operation if there is a history of previous attacks, even mild ones, and if an early rigor is associated with an acute attack. Instead of opium he preferred to use belladonna, which relieves spasm and does not dull the senses and so mask the symptoms. Regarding the question as to how long it is safe to wait, he said that unfavourable symptoms were—(1) Continuance of severe pain, despite treatment; (2) recurrence of paroxysm of pain; (3) palpation of cæcum, revealing local tenderness and swelling. Medical treatment should not be persisted in for more than forty-eight hours. A high leucocyte count, with a continuance of local and general symptoms, indicate the formation of pus. Mr. COTTERILL said, he regarded pain, tenderness, and rigidity of the right lower quadrant of the abdomen as the three cardinal symptoms. A quick disappearance of the pain is very unfavourable if the pulse remain bad, and indicates gangrene. Frequency and pain on micturition indicate that the appendix is in the pelvis. Vomiting lasting for twenty-four hours is very serious. Obstruction is not commonly complete, and, when complete, the case is practically hopeless, as the obstruction generally occurs so late. Dr. HALDANE (Bridge of Allan) advocated medical treatment by salol and calomel. He used strychnine for the pain, with marked benefit. Dr. CRAWFORD RENTON (Glasgow) said, that he would wait till a catarrhal attack was over before removing the appendix, but he would remove it in all cases. Dr. JAMES RITCHIE would not advise removal after one acute attack unless tenderness could be elicited. Mr. CAIRD said, that the diagnosis is one of localised peritonitis, and therefore the local tenderness is the chief symptom. He relied chiefly on the general aspect of the patient as an indication for or against operation. Mr. STILES said, he found that acute attacks were much more serious in children than in adults. He would always operate at once in a clearly defined case, and regarded the persistence of vomiting as the most significant symptom, pain being so difficult to estimate in children. The pulse is the next in importance; a weak soft pulse of ordinary rate being more significant than a quiet and full pulse. He advocated examination under chloroform as an important aid in diagnosis. He would operate within twenty-four hours in every case ushered in by acute symptoms, and in which there is a persistence of one particular symptom, he did not care which.—Dr. AFFLECK spoke on the diagnosis from typhoid fever and Dr. GULLAND on the importance of an examination of the blood.

Edinburgh Obstetrical Society.—*January* 13, 1904.—Dr. **Brewis**, President, in the chair.—Dr. **Munro Kerr** read a paper on "Vaginal Cæsarean Section." He gave a brief history of the operation, which was introduced by Dührssen in 1895, and then considered the indications for the operation. He discussed its advantages and disadvantages over forcible dilatations with metal dilators such as Bossi's, and finally described two cases in which he had successfully performed the operation.—Dr. J. W. **Ballantyne** read a paper on "The Use of Bossi's Dilator in Seven Cases of Complicated Labour." He made some remarks on the disturbance and readjustment of medical opinion which always followed the introduction of a new method of treatment, and pointed out the value of case records in establishing such a readjustment. He then described seven cases of complicated labour in which he had used Bossi's dilator:—Case 1.—1-para; eclampsia, œdema, narrow pelvis, R.O.P. position, head imperfectly flexed; dilatation with Bossi, forceps, basilysis; third stage hæmorrhage, adherent membranes; maternal recovery. Case 2.—1-para; 6½ months' pregnancy, eclampsia; dilatation with Bossi, forceps; fœtus non-viable; maternal recovery. Case 3.—1-para; eighth month of pregnancy, eclampsia, R.O.P. position; dilatation with Bossi, forceps; maternal and infantile recovery, death of infant two months later. Case 4.—4-para; albuminuria, rigidity of cervix of peculiarly persistent and resistant type; R.O.P. position; digital and then Bossi's dilatation, forceps; maternal and infantile recovery. Case 5.—3-para; narrow pelvis; induction of premature labour, vaginal douching, dilatation with Bossi, forceps; maternal recovery, infant died in a few hours. Case 6.—1-para; narrow pelvis, post-maturity of pregnancy; induction of post-mature labour, vaginal douching, bougie, Bossi, forceps; maternal recovery, infant still-born. Case 7.—5-para; hydramnios, placenta prævia, face and neck presentation, anencephalic fœtus, rigidity of cervix, uterine spasm; bimanual version failed; digital and Bossi's dilatation; failure of podalic version; other means failed; breaking up of presenting parts; piecemeal extraction; maternal recovery. In conclusion, Dr. Ballantyne made some general remarks on the value of Bossi's dilator.

Glasgow Pathological and Clinical Society.—*January* 11, 1904. —Mr. A. E. **Maylard**, President, in the chair.—Dr. **Rowan** showed an infant suffering from a growth of the iris, which he believed to be a gumma. There was a distinct syphilitic history.—Professor **Muir** showed a hæmorrhage into the pons Varolii and crura cerebri, and granular kidneys from the same case.—Dr. A. N. **M'Gregor** demonstrated a case of varicosity of both superficial epigastric veins. The condition commenced after an attack of enteric fever seven years ago, and was regarded as due to thrombosis of the iliac veins on the left side. The varicosity acted as a relief channel, the blood flowing up the left epigastric and through a large anastomosis and down the right epigastric to the right femoral vein. The veins emptied when patient was in the recumbent position. Dr. M'Gregor was of the opinion that the lumen of the thrombosed vessels had partly been restored.—Dr. **James Carslaw** and Professor **Muir** described the clinical and pathological features of a case in which rupture of a hydronephrosis occurred.

The illness set in with vomiting and pain, which suggested appendicitis. Operation revealed a swelling round the right kidney. The swelling was then incised and drained from behind. Patient died from suppression of urine, which set in immediately after the first vomiting. At the post-mortem, bilateral hydronephrosis with rupture of the pelvis of the right kidney was discovered. The nature of the obstruction could not be made out. Kinking of the ureters appeared to be the most probable cause.—Mr. **Henry E. Clark** showed an eyeball which had been removed on account of tumour, which he believed to be a secondary deposit resulting from carcinoma of the mamma. The tumour of the mamma had been removed four years ago.—Mr. **Rutherfurd** showed—(*a*) A specimen of hydronephrosis (unilateral), due to kinking of the ureter by the renal vessels; and (*b*) a humerus, the seat of rapidly developing sarcoma in relation to an injury. Three weeks after a fall patient was examined, but no evidence of fracture was found. Three days later fracture resulted from another fall, and a tumour then rapidly developed. The arm was amputated seven weeks after the first injury; patient (a boy about 6 years old) died from shock.

Card Specimen, by Mr. **Rutherfurd**.—An implantation cyst of the finger, of twelve years' duration.

Glasgow Medico-Chirurgical Society.—*January* 8, 1904.—Professor **M'Call Anderson** showed a case of splenic anæmia. The enlarged spleen could be felt, reaching below the level of the umbilicus. The patient is able to follow his occupation as an electrician.—Dr. **Walker Downie** showed—(*a*) A patient with partial stenosis of both nares, resulting from the passage of a bullet through the bones of the face. The patient, a young man, was shot at Ladysmith in January 1900 with a Mauser bullet at a distance of 30 yards. The bullet fractured the hard palate and superior maxillary bones. The raw surfaces adhered together, giving rise to stenosis of both nostrils. The left side has been treated and is now patent. (*b*) A tooth-plate which lay in the trachea for 3 months—removed by tracheotomy. The patient, a male æt. 33, was injured in the Ibrox disaster, and was unconscious for 14 days. After recovering consciousness he suffered from huskiness and dyspnœa on exertion. An examination of the larynx revealed a foreign body at the level of the third ring of the trachea. The foreign body was removed by tracheotomy, and proved to be a small plate with a tooth attached.—Dr. T. K. **Monro** showed a boy of 12 years with hemiplegia and aphasia, which followed severe gastro-enteritis. Whilst the gastro-enteritis continued, the boy was comatose, and a bed-sore formed on the left buttock. At the end of three weeks convulsions set in and lasted for a fortnight, diminishing gradually in severity. The power of speech at first was completely absent. He can now, six months after the beginning of the illness, speak fairly well, but is still unfit for continued conversation. He understands all that is said to him. The heart is normal. Dr. Monro believed the condition to be due to thrombosis.—Dr. **Alexander M'Lennan** demonstrated a simple way of making a half-box splint from junk.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

The Royal Infirmary. A MEMORANDUM, submitted by Sir John Batty Tuke to the Committee of Contributors and Managers of the Royal Infirmary, contains closely reasoned and thoroughly matured opinions on the subject of the proposed age limit. He begins by pointing out that he has, in about fifty years' experience, only known one case of a man holding the position of Ordinary Physician or Surgeon to the Infirmary at an age beyond 65, and he does not consider that the history of the Infirmary justifies the establishment of an age limit for the Ordinary Physicians and Surgeons. The author of the Memorandum presents three questions for consideration, and to these in turn we must direct attention.

1. Is the establishment of an age limit of 65 equitable, as regards certain of the Assistant Physicians and Surgeons? The Memorandum points out that certain existing assistant medical and surgical officers will evidently be deprived of the privileges they had every right, at the date of their appointment, to anticipate, in accordance with use and wont, and that they were elected in full knowledge on the part of the Board of these facts. The opinion expressed is, that matters should be allowed to go on as in the past, trusting to the high professional and personal character of the assistant medical and surgical officers, which will prevent them from retaining posts the duties of which they are not able to fulfil.

2. Will such an age limit get the Board out of the difficulty as regards stagnation of promotion? In answer to this, Sir John Tuke does not think any such proposal will relieve the Board of their troubles. As matters stand at present, many years must elapse before any sensible effect on the present position can be obtained, and, in the meantime, a policy might be adopted which would obviate, on the one hand, stagnation in the future, and, on the other, the risk of the retention of senile officers.

3. Cannot a better policy, or policies, be adopted for its prevention? Two alternative plans are suggested. In the first place, there is the method submitted by the Infirmary Staff, *i.e.* the appointment of a number of Extra- or Sub-assistant-physicians and surgeons, who might be regarded as in training for the higher offices of assistant-physician and surgeon. The second suggestion is proposed by Sir John Tuke himself, that an age limit would be better applied at the beginning than at the end of a man's career. His belief is, that it would be wise to enact that no application for the post of Assistant Physician or Surgeon should be received from men whose age exceeds 33 years.

As regards the proposal to apply an age limit to the Professors, Sir John Tuke points out that, from the commencement of their teaching, no limitation of tenure of office has ever been indicated, which suggests an original intention that Professors should hold their posts *ad vitam aut culpam.* It seems to the author of the Memorandum that, if the proposal were adopted, men who had reached the acme of their fame and reputation would be debarred from conveying the results of their matured experience to their pupils, and applying it to the treatment of Infirmary patients, at the very age when, as physicians, they were enjoying the confidence of the public.

With the views of this Memorandum we are in hearty agreement. With the author, we believe that the whole question has been raised on false issues, that it is impossible to foresee any benefits from the adoption of the new proposals, and that it is not difficult to discern injurious possibilities. As remarked in our last issue, we earnestly hope that the result of the conferences and of the meeting of the Court of Contributors next month will be the maintenance of the present state of matters.

The Surgical Out-Patient Department of the Royal Infirmary.

THE administration of the Surgical Out-Patient Department of the Royal Infirmary, particularly with regard to the arrangements made for dealing with cases of accident, has, within the last few weeks, been made the subject of some adverse criticism in a section of the local press. Much of what has been written has been in the form of "Letters to the Editor," for the most part anonymous, and may be passed over without comment, further than to say that the most superficial inquiry, on the part of those responsible for the publication of the letters in question, would have saved them from the reproach of having given currency to statements which were wanting in accuracy and were detrimental to the interests of a great public charity.

The chief cause of complaint appears to be that there is frequently unnecessary delay in dealing with casualties arriving at the Hospital. We are not prepared to deny that this is occasionally the case, but would remark that to a person in that state of excited uncertainty which follows an accident, any period of waiting seems unduly long, and should he be in pain he is not likely to under-estimate the time during which he is kept in suspense. The distressing case in regard to which the present discussion arose is an illustration in point. An unfortunate child was severely burned in the Stockbridge district of Edinburgh, and was driven with all possible haste to the Infirmary, in its mother's arms. On its arrival at the out-patient room, the house-surgeon was summoned, and after he had examined it the child was taken to the wards. We can well imagine that to the mother, in her anxiety for her child, every moment of delay would seem hours, and that in her description of the events she might, all unconsciously, exaggerate the length of time which elapsed between her entering the Hospital and her child being attended to by the doctors and nurses. That her published statement—or shall we say the statement attributed to her, for it savoured more of "copy" than of the language of the people—was not in all essentials accurate, was proved by a subsequent inquiry made at the instance of the Infirmary Managers, with every desire to ascertain the facts, and if necessary to apportion the blame.

Nor do we think it necessary to make any reference to the criticisms of certain quondam patients on the methods of treatment adopted, and the selection of the time for carrying these out. It may not be generally known to the laity that, under certain circumstances, it is not advisable to proceed at once to set a fractured limb, and that the patient's interests are best considered by delaying this procedure for six, twelve, or even twenty-four hours, but such is the case.

At the same time, it must be admitted that "there's aye some water whaur the stirkie droons," and we are free to confess that in our opinion the Surgical Out-Patient Department of the Infirmary is not on the same level of efficiency as other departments in the institution. This fact has not been overlooked either by the Staff or the Managers, and some months before public interest on the subject was aroused by the newspaper correspondence, to which we have alluded, a Committee of the Managers was appointed to investigate the matter, with a view to carrying out such reforms as might be found necessary. In their work, we understand, they have had the hearty co-operation of the Staff, and we trust that ere long any grounds of complaint which may at present exist shall be removed.

It appears to us that the present time is peculiarly opportune for making such changes, as structural alterations are now being made on that portion of the Surgical Hospital adjacent to the Out-Patient Department, and the opportunity has arisen of acquiring the first essential to the formation of a satisfactory department—more accommodation. The space to which we refer is the ward previously occupied by ophthalmic cases, and the rooms hitherto used as the Ear and Throat Out-Patient Department. In our opinion, this space should be devoted to surgical purposes, and at the present moment one of the first claims on the resources of the Infirmary is the establishment of a properly equipped Surgical Out-Patient Department. Until this claim has been met, we feel that the Management is not justified in furthering any of the new developments which have recently been adumbrated, particularly if these schemes involve devoting space in the Surgical Hospital to medical purposes.

Of equal importance to the provision of suitable accommodation is the appointment of a full and independent out-patient staff. At present the out-patients under the care of the different surgeons are attended by the junior (non-resident) house-surgeon attached to his wards. In addition to his work in the Out-Patient Department, this gentleman has duties in the wards, and it not infrequently happens that he is called upon to assist in the operating theatre or in the wards, with the result that he is not immediately available to attend on cases of accident admitted to the casualty room. So long as this arrangement exists, the delays of which complaint has been made are inevitable, as it is often impossible for the doctor to leave the work he has in hand—say the administration of chloroform—to attend to a crushed finger in the Out-Patient Department. But in a large hospital, like the Royal Infirmary of Edinburgh, even a crushed finger should be attended to at once. We are strongly of opinion that the Out-Patient Department should be administered by a Resident Staff, consisting of at least two qualified house-surgeons, who shall have no duties in the Infirmary beyond those of their own department. One of those house-surgeons should always be on duty, and on the spot, so that he is immediately available when an accident arrives. A bedroom should be provided, close to the Out-Patient Department, for the house-surgeon on night duty, to avoid the unavoidable delay involved in bringing him from the residency, which is situated in the middle of the building.

One other point we may refer to, and that is the necessity of carefully selecting and closely supervising the night porters. It is within our knowledge that the carelessness and incapacity, from one cause or another, of these officials have been responsible for delays which have been wrongly attributed to the house-surgeon on duty.

The Extraction of Teeth under Chloroform.

From time to time the public are painfully impressed by a paragraph in the newspapers headed "Another Death from Chloroform!" We heard a medical man remark recently, that "it was a pity such notices were published and the public alarmed," but we cannot agree with this opinion. We consider the sooner the laity are alive to the risks they run, during so simple an operation as the extraction of a few teeth *under chloroform*, the better for all concerned.

The most recent case of death occurring under these conditions, which we have noticed, is that of a young clergyman in the west of Scotland, who was put under chloroform in his own house, for the purpose of extracting a few teeth. Within a few minutes he fell forward and expired.

This is the fourth case of the kind we have known of within a comparatively small area during the last twelve months. All these patients died of heart failure, we are safe to assume, but whether they actually had an overdose or not we are unable to say, nor from our point of view is it of much moment. The point is, that they should never have been subjected to the risk of chloroform, but one of the now fairly numerous safer anæsthetics should have been employed. For the past ten or fifteen years most dental and surgical journals have been urging the utter unsuitability of chloroform as an anæsthetic in dental work, and still the medical profession, in North Britain at least, persist in employing chloroform for the operation in question. In dental work the mortality under gas and ether is a negligible quantity, and year after year dental surgeons are being sent out, for the most part trained to administer this combination; and if the medical profession in Scotland refuses to wake up to the facts of the case, the dentist will, in all probability, take the bull by the horns and dispense with the services of the medical attendant, if they are to be of so lethal a nature.

The administration of chloroform for the extraction of teeth should, and we consider soon will be, regarded as malpraxis.

The Rectorial Disturbances.

THE disorderly proceedings which marred the rectorial address given by Sir Robert Finlay will, we feel sure, be deeply regretted by every one who has the reputation of his Alma Mater at heart. These proceedings, following as they did the even more regrettable disturbances which characterised the Dufferin address three years ago, have earned for our University an undesirable notoriety. We cannot, indeed, recall any occasion when the University has been the subject of so much adverse criticism, by press and public alike, as has occurred within the last few weeks. We have neither the desire nor the inclination to explain away these disturbances, and we have no intention of endeavouring to combat the hostile expressions of opinion which they have elicited from an indignant public, for we realise that, no matter how hard these opinions have been to bear, they have been fully deserved.

Many attempts have been made, in the correspondence columns of the press, to discover those primarily responsible for the rowdyism which is now an inseparable concomitant of a rectorial address, but as these attempts have been mostly made by irresponsible persons, who are not cognisant of the inner workings of the University, they have resulted largely in failure. It is an obvious truism that the disturbances are and were created by the undergraduates of the University, and that the persons responsible for the maintenance of discipline amongst these students are the University authorities themselves. In seeking to apportion the blame, therefore, the first and larger share must be attributed to the Senatus Academicus, and the second and smaller share to the Students' Representative Council.

As regards the Senatus Academicus, the *University Calendar* states that it is their duty to superintend and regulate the teaching and discipline of the University; the latter part of this duty is, we fear, neglected. The general public are perhaps not aware of the fact that the proceedings which disgrace the rectorial addresses are of almost daily occurrence in certain of the University classes. We have ourselves seen a University Professor leave the class-room because he could neither control nor quell the disturbance prevailing. This being the case, if the undergraduates, seeing that they can do exactly what they please in their ordinary everyday classes, naturally assume that it is their bounden duty to create a pandemonium on special occasions, like academic holidays and rectorial addresses, who can blame them? If no discipline prevails on ordinary occasions, the public cannot complain of its absence on special occasions. For our part, we believe that it is the bounden duty of the Senatus Academicus to maintain discipline in class. If the professor himself is incapable of maintaining order in his own class, his hands should be strengthened by the rustication, by his colleagues, of the ringleaders. If every class-room disturbance was followed by a few rustications, rectorial rowdyism would soon be a thing of the past.

The Senatus Academicus are again much to blame for the peculiar management, or rather mismanagement, which prevails on the occasion of a rectorial address as regards the internal arrangement of the M'Ewan Hall. Some of the tickets are distributed by the Secretary to the Senatus, others are handed over to the Students' Representative Council, some are balloted for; and confusion worse confounded reigns supreme. Certain representations have already been made to the Senatus Academicus for the better management of future rectorial addresses. For our part, we should advise that on future occasions the Senatus Academicus take full control of the internal management of the M'Ewan Hall, and that the students be warned a week in advance, that, in the event of any disturbance, the ringleaders will either be rusticated or expelled from the University.

As regards the Students' Representative Council, their duties are rigidly defined in the *Calendar*, and it must be remembered that the maintenance of order or discipline amongst their fellow-students is not amongst such duties. The riot in the M'Ewan Hall cannot, therefore, be attributed to the Council. What can be attributed to the Council, however, is the insulting incident which took place at the close of the address, and the half-hearted apology which was tendered by that body, who, in the words of one of their own presidents, "refused to grovel at the feet of the Senatus." The leading "impersonator" in the incident referred to was a member of the Council, and, according to his own statement, he was aided and abetted in his misguided and insulting "practical joke" by other members of the Council; when given an opportunity, moreover, of offering a public apology, he declined to do so. Surely two years' rustication for conduct such as this is not too severe a penalty. The apology offered by the Council to the public for the disturbances in the Hall was halting and inadequate, and was altogether spoiled by the language, above quoted, from the speech of one of the Council's Presidents. On these two indictments, but not on that of failure to maintain discipline, the Council are seriously to blame.

Marriage and the Race.

THE death of Herbert Spencer has many suggestions for the man who is seriously concerned as to the question of the deterioration of the race. There are, indeed, many who are concerned, but few who are willing to make that sacrifice which is necessary for a radical attempt to get at the root of the matter. Nothing is more characteristic of the human race, than its willingness to accept great truths from great philosophers, and yet be unwilling to pursue the conduct which ought to be the practical outcome of those truths. The fact of the matter is, that altruism still remains a mere dream of the philosopher, and that man remains an egoist, on very much the same level as he has remained from the beginning of time. He is quite willing to do a bit of journeyman patching when he sets his hand to social reform, but he has not the courage or the initiative to go down to the very base of the matter and examine the roots of the upas tree of degeneration. Whenever a voice is heard calling out a note of warning, he turns an academic ear to the speaker, and, having written numerous articles and books on the subject, forgets all about it, and goes on with his own little games of make-believe. When Mr. George Bernard Shaw wrote his "Man and Superman," the majority took him for a clown, and the few who took him seriously threw down the book, saying, "The thing's impossible; you cannot change first principles." Now, when man has thus expressed himself, he thinks he is terribly convincing, and that the matter is closed. And to what is all this a preamble? Nothing less than an assertion, that the main evils at the basis of degeneration are our present *laissez-faire* methods of conducting the union of sexes in marriage. So long as the State permits, and so long as mankind blindly pursues, its instinctive or its selfish methods of mating, so long will there be no visible improvement in the physique of the race. Are we arguing in favour of the methods of Lycurgus, or even the suggested principles of Bernard Shaw? No; we are only suggesting that some serious attempt should be made to follow the wise teachings of Herbert Spencer, of Huxley, of Westermarck, of Maudsley, and of Letourneau, in as far as they affect the question of the marriage of degenerates—whether these are tuberculous, syphilitic, or neurotic. What is the bequest of a few millions sterling per year to the charitable institutions of this country, when our whole system involves a bequest of millions of imbeciles, idlers, criminals, consumptives, and syphilitics to the great stock of civic life? The system is very much on the principle of the criminal who drops in a penny in the church plate on Sunday to counteract the crimes of the week, or of a physician who would prescribe a weekly dose of salts for a habitual drunkard. In fact, our whole social system, examined on these lines, is one magnificent piece of presumptuous quackery; and as for the voice of philosophy and science having any effect on the action of common man, with his selfish aims, his plausible delusions, and his careless aspirations, the whole thing is a delusion and a snare! Royal Commissions, Committees of the Royal Colleges, Sanitary Societies, Societies for Improving the Condition of the Poor, may sit for eternity, but they will do little real or essential good unless they can impress upon the race the stern fact that the marriage of diseased and degenerate persons is a *crime* against the main principles, and *ergo* the holiest foundations, of society. What is that mighty force, the pulpit, doing in the matter? It inveighs against sin and its results, but the language of the cleric is so stereotyped and inadequate that it seldom reaches the conscience of the people. When has a parson been known to warn his flock of the danger, moral and physical, of indiscriminate marriages? when have they been known to preach the holiness of health? Let them join hands with the physician on this matter, and we might get seriously to work. Our present easy contentment and academic and ecclesiastical aloofness is a slur on the moral sense of the community.

The Cornish Riviera. THE illustrated pamphlet on Cornwall, recently issued by the Great Western Railway, is worthy of more than passing notice, for several reasons. From three points of view, at least, the Duchy will always be an object of attraction. Its old traditions and monuments must arouse the interest of every one who loves to trace the history of his country. Here it was that the Briton first came into touch with the early pioneers of civilisation from the Mediterranean. Around Cornwall, further, hang the principal legends of Arthurian romance; although it seems probable, and is indeed admitted by recent Cornish authors, that this great British monarch fought his last fight and passed to his rest on the shores of the Forth, yet the scene of his birth and the chief region of his exploits were certainly in the south-west. In Cornwall, as in Kintyre, may also be traced the profound influence of those early missionaries of Christianity who were nurtured in the school of St. Patrick. Numerous place names in Cornwall are of Gaelic, not of Cymric origin, and Hibernian saints are rescued from oblivion in many instances by their Cornish associations. The Scots of Dalriada have engraved their language deeply upon the soil of Cornwall as well as of Argyll. To this day, vestiges of a forgotten faith, and emblems of the newer belief which arose in its stead, are spread broadcast over the Duchy. Menhirs, dolmens, and cromlechs are found closely associated with crosses, wells, and chapels; to the antiquarian and ecclesiologist, therefore, Cornwall is full of interest.

From the banks of the Tamar to the western sea, from the heights of Tintagel to the cliffs of the Lizard, the whole of the Cornish coast is beautiful, and the seeker after the picturesque will always find himself amply repaid by a study of the borders of the Duchy. It is a land of lofty promontories and deep coves, of majestic headlands and lovely bays. It has quaint villages nestling in cosy nooks, and overhung by beetling cliffs; it has imposing towns stretching along open bays. Nothing can exceed in picturesque beauty St. Michael's Mount in Mount Bay, and for him who knows Mont St. Michel, on the other side of the Channel, the comparison of the two scenes is of the deepest interest.

From our present point of view, however, the chief interest of Cornwall lies in its remarkable climate. The most striking fact, especially in its western portions, *e.g.*, Falmouth, Fowey, Penzance, and St. Ives, is its wonderful equability. The average temperature in January is about the same as at Montpelier, and the difference between the winter and summer mean temperature is only about 16°. In the matter of bright sunshine Cornwall is particularly favoured, as, with the exception of the Channel Islands, it is at the top of the list in having the highest percentage of sunshine possible. According to various statistics that have been published, from the times of Dr. Paris down to last year, it may be safely asserted than no climate in Europe possesses so small a range of temperature, while, in the British Isles, there is scarcely a spot with more of sunshine. And if this be so of Cornwall in general, it is more particularly so of the Scilly Isles—the surviving peaks of the submerged realm of Lyonnesse—

> "A land of old upheaven from the abyss
> By fire, to sink into the abyss again;
> Where fragments of forgotten people dwelt,
> And the long mountains ended in a coast
> Of ever-shifting sand, and far away
> The phantom circle of a moaning sea."

Frost and snow are practically unknown; spring begins with Christmas and lasts till April, when summer commences and remains until October, followed by autumn going on till the end of December. The collection of tropical plants flourishing at Tresco is proof of the genial climate of the archipelago—

> "A small sweet world of wave encompassed wonder";

and the flowering of spring plants, at a time when winter holds the land elsewhere in its icy grasp, is proof of this. For many years we have been in the habit of recommending patients requiring an equable climate to seek health and pleasure in Cornwall, and we are glad that the enterprise of the Great Western Railway is bringing this healthy and interesting part of the country within reach of all.

Tenth International Congress of Ophthalmology.

THE Committee of the Tenth International Congress of Ophthalmology at Lucerne, which will meet on 18th September 1904, has entrusted Dr. Siegrist with the arrangements for the exhibition of apparatus, instruments, and appliances for teaching, which may be sent to the Congress. Dr. Siegrist has requested us to announce to members of the medical profession and scientific instrument-makers, who may wish to exhibit at the International Ophthalmological Congress in Lucerne, that they should apply to him before July 1, 1904, giving an exact statement of the object to be exhibited, of the space demanded, and of the kind and strength of electric force which may be required.

ORIGINAL COMMUNICATIONS.

HERNIA.[1]

By RUTHERFORD MORISON, F.R.C.S., *Surgeon to the Royal Infirmary, and Consulting Surgeon to the Dental Hospital, Newcastle-on-Tyne.*

Inguinal.—Seventy-five cases, radical cure—all recovered. Youngest, 10 months; oldest, 80 years.

Inguinal strangulated.—Six cases—five recovered, one died.

Femoral.—Ten cases, radical cure—all recovered.

Femoral strangulated.—Two cases—one recovered, one died.

Umbilical.—Two cases, radical cure—all recovered.

Ventral.—Eight cases, radical cure—all recovered.

The inguinal herniæ include—Three recurrences, one interstitial, one Littre.

THE present paper is concerned only with abdominal hernia, and with that form of it which appears externally.

In every 1000 of the population, at least five suffer from hernia, and males in the proportion of 3 to 1 of females.

Generations of surgeons have been attracted to the study of a disorder so common, and entailing such an immense total amount of suffering, disability, and danger; but only during the last ten years has any substantial advance been made in its treatment. Operation for the radical cure of hernia obtained professional recognition in this country chiefly by means of the pioneer work of Sir William Mitchell Banks. Operation can now be undertaken with excellent prospect of success; but even at the present time it is still necessary to draw attention to the importance of the results thus obtained.

The most common varieties of hernia are, in the order of their frequency—*inguinal, femoral, and umbilical.* All of them occur at naturally weak areas of the abdominal wall, appearing where blood vessels or other structures normally pass out. Thus inguinal herniæ accompany the spermatic cord or round ligament; femoral and umbilical, the corresponding blood vessels; and the same holds good for the rarer varieties—obturator, sciatic, and lumbar; whilst the scar herniæ are generally found in the mid-line below the umbilicus, because yielding scars are most frequently found there.

Herniæ are described as congenital when they make their escape through openings which are normal in fœtal life, but abnormal when persisting at a later stage; traumatic, when they result from injury; and acquired, if otherwise inexplicable.

---

[1] Statistics supplied by G. Grey Turner, Surgical Registrar, Royal Infirmary, Newcastle-on-Tyne, of herniæ operated upon by Mr. Morison during 1903 in the Infirmary and private Hospital.

Congenital Hernia is satisfactorily explained by the presence of developmental defects in the inguinal and umbilical regions, in the linea alba, and in the diaphragm.

Traumatic Hernia, resulting from the stretching of a scar in the abdominal wall, the result of operation, or of subcutaneous rupture of the muscles, or following suppuration of the abdominal wall, is also readily understood; and no question as to its cause is likely to arise. The part played by traumatism in others is not so clear, but it may be safely said that the sac of an acquired hernia cannot be formed suddenly; it must develop by a slow and gradual distension of the peritoneum.

Acquired Hernia.—The fact is universally recognised, that in the majority of individuals all the known predisposing and exciting causes acting together would not produce a hernia; which amounts to admission that of its real cause we are ignorant. The suggested "inherent weakness of the abdominal walls," "too patent rings," "too long or too lax a mesentery," are attempts to offer more definite meaning to the recognised lax fibre and hernia belly generally associated with subjects predisposed to hernia. Certain circumstances are, however, well known to favour the development of an acquired hernia. The most important are such as frequently, suddenly, and intermittently cause marked increase of the intra-abdominal tension, and certain kinds of laborious work occupy the chief place. This explains the large number of our operations for radical cure, the majority being performed for miners, whose work, in addition to being laborious, has often to be carried on in cramped and unfavourable postures. Chronic cough, severe, long-continued constipation, and difficulty in micturition, are other ordinary predisposing causes. Less frequently, repeated pregnancies, obesity followed by emaciation, ascites—anything which causes stretching of the abdominal walls and a consequent lack of abdominal support—can help the formation of a hernia.

The ordinary coverings of a hernia, though possessed of some anatomical interest, are of little or no surgical importance, for they are seldom recognisable during the course of an operation. It may be, however, of the greatest importance to distinguish the subperitoneal fat from omentum, and to recognise the peritoneum forming the sac.

The subperitoneal fat possesses occasional pathological importance and interest, and so deserves special consideration. A localised hypertrophy of the subperitoneal fat, or the development of a tumour from it, results in a swelling described as a subperitoneal lipoma. These growths are most commonly found in or near the linea alba, above the umbilicus, where the meshes of fibrous tissue closing the abdominal wall are normally wide. They are frequently seen in the femoral region, and more rarely at the umbilical and inguinal sites.

THE RING.—The opening through which a hernia protrudes is called the ring, and the position of this gives its name to the hernia.

THE SAC may be absent in traumatic hernia, when the peritoneum has been torn; or may be only partial, in the case of the prolapse of an organ with a limited peritoneal covering, such as the bladder or the cæcum.

It is usually a simple pouch of parietal peritoneum, pushed before the protruding viscera; but it may have a more complicated construction, resembling an hour-glass or other fanciful shape, and possessing diverticula extending from it.

Hydrocele of a hernial sac, mentioned in every text-book, is so rare as never to have been seen by the majority of surgeons.

CONTENTS OF THE SAC.—The most frequent are the small intestine (enterocele), and of this the lower end of the ileum, and omentum (epiplocele), because these are the most movable of the abdominal viscera: but every other abdominal organ (pancreas excepted), even the pregnant uterus, has been recorded as found in a hernial sac. The bladder is said to be met with infrequently as the occupant of a hernial sac, and this is so; but the importance and the frequency of its occurrence in this position have been vastly under-estimated, for I have had the dangerous experience of opening it more than once in both inguinal and femoral herniæ.

Diagnosis.—A reducible enterocele has a marked expansile impulse on coughing, and is tympanitic on percussion; it disappears with a gurgle, and the last portion abruptly, when the patient lies down or when taxis is employed. A reducible epiplocele has an expansile impulse on coughing, it is dull on percussion, and the mass of lobulated fat can often be felt; it is not so readily reducible as the intestine, and disappears more slowly and without a gurgle. Both are free from pain or tenderness, and are soft.

On reduction of either, a finger, conveying before it the skin covering the sac, can be introduced into the ring, to verify the diagnosis and estimate the size of the opening. If the hernia is irreducible, diagnosis may be more difficult. Irreducibility usually depends on the presence of omentum in the sac; for, from its liability to injury and inflammation when in this position, it frequently contracts adhesions to the walls of the sac, or becomes thickened and indurated, forming an irreducible lump. If the fat lobules of the omentum can be palpated, and if a history can be obtained that at an earlier stage the swelling went back at night, there can be little doubt as to the diagnosis. A subperitoneal lipoma is the most difficult tumour to distinguish from hernia. It is met with rarely in the inguinal region, most frequently in the linea alba, and not very rarely at the site of a femoral hernia. This fact, the history, and the absence of an expansile impulse, though a forward one can be felt, are the chief aids in forming a diagnosis. Every hernia has a pedicle, and this serves to distinguish it from the majority of other tumours of the abdominal wall.

Treatment.—This may be palliative or radical. In children there is a natural tendency to cure by the obliteration of congenital openings. In adults, cure may result from adhesions blocking the neck of the sac, especially after long wearing of a truss, or by adherent omentum in the neck of the sac. In one patient, the subject of inguinal hernia for many years, in whom spontaneous cure occurred about middle life, I found, on post-mortem examination, the neck of the sac so tightly corked with adherent indurated omentum, that it appeared to be impossible for a hernia ever to have appeared there again.

The tendency to spontaneous cure may be aided by the application of a truss, and in children two-thirds of cures follow faithful and intelligent truss treatment. It is a mistake to think that palliative treatment necessarily means a truss and radical treatment an operation; for the truss may cure, and operation may only palliate. Herniæ, incurable by a truss, are cases for operation. The first requirement for the satisfactory application of a truss is that the hernia shall be reducible. If it is irreducible, a cup-shaped pad or suspensory bandage has to be substituted for the ordinary support, and these are always more or less unsatisfactory. The sooner truss treatment is commenced the better. A child is never too young to wear one, if proper care be taken in the application of the truss and in its after-treatment. The celluloid and vulcanite trusses made for children have overcome all the objections to the use of instruments at an early age. Elaborate directions are given in every book on hernia for the measurements and fitting of trusses. Few medical men pay any attention to them. The patient has to be sent to a trustworthy instrument maker, with directions to get a truss fitted, and must return for examination when he gets what is considered suitable. A good truss should keep the hernia reduced in every position of the body and under severe strain, and should be comfortable. It will be comfortable if the spring is not too strong, and the pad not too small, and if it fits properly. The pressure of the pad can seldom be tolerated all day at first, and directions are given that the truss be removed at convenient times till tolerance is established. Some skin irritation usually follows the pressure and friction of the truss in the early days. This may be relieved by bathing the skin with methylated spirit, and drying and dusting the surface of it under the pad with a powder consisting of 4 parts of starch and 1 part of boracic acid.

The operation for radical cure has now, at least in inguinal and femoral hernia, been so perfected, that operation is no longer regarded as a course to be reserved for exceptional cases. The contra-indications to operation are few. They are in adults chiefly those opposed to any operative interference, such as serious organic disease of the heart or lungs, diabetes, kidney disease, feeble old age, chronic bronchitis or asthma, and extreme obesity. Enormous size of the hernia, with impossibility of its total reduction on account of diminished capacity of the abdominal cavity, is the chief local obstacle to operation. In children under puberty, disease and the probability of satisfactory truss treatment contra-indicate operation.

The principles of the operation are simple. They are, to remove the entire sac, and to firmly close the orifice through which the hernia made its exit. The risks of the operation are small, except in the case of difficult umbilical herniæ and enormous inguinal ones. Excepting these, statistics give a mortality of something like 0·5 per cent. In several hundred inguinal cases of my own, there has been but one death, and that occurred from an avoidable surgical calamity—wound of the bladder.[1] The permanent results of later years have steadily improved; and at the present time, without selection of cases further than above indicated, it would be fair to say that the number of cases in which recurrence will take place is not more than 5 per cent.

INGUINAL HERNIA.—The probability is that all cases in females are congenital, and due to non-obliteration of the canal of Nuck, a peritoneal diverticulum accompanying the round ligament. In males, the only certain evidence of a congenital origin is the presence of a testicle in the sac. But the probabilities are in favour of a congenital origin, if operation shows that the elements of the cord are spread out on the back and sides of the sac and are adherent to it, from an unusually scanty supply of subperitoneal fat. The same may be said regarding the history, not uncommon, of the sudden appearance of a scrotal hernia which suggests the presence of a preformed sac.

Acquired inguinal hernia occurs in three forms—oblique or external, direct or internal, and interstitial, which is probably more closely related to the congenital than the acquired variety.

Diagnosis.—The most singular case of mistaken diagnosis which I ever met with was the following. I was asked to assist a surgeon to do an operation for the radical cure of a femoral hernia in an elderly female. The swelling turned out to be inguinal, not femoral; on opening the sac, it was found to be a hydrocele, not a hernia. A small body which was taken to be an ovary was removed from it, and found to have a vas and an epididymis; physical examination revealed the fact that there was only a rudimentary vagina, and that the patient was not a female but a male.

When the signs of a hernia are quite definite, the first point is to ascertain whether it is inguinal or femoral. This is not always easy, and if the patient is obese and the hernia irreducible, it may be impossible. If the swelling is reducible, and if the orifice of the hernia lies above Poupart's ligament, it is inguinal. In fat patients Poupart's ligament may be difficult to define, but the pubic spine is always an available landmark. An inguinal hernia lies above a finger placed on the pubic spine. A scrotal hernia may reach such an enormous size as to bury the penis and occupy the whole furrow between the thighs. It may then be difficult, without careful examination, to say to which side the hernia belongs; but this can be ascertained by discovering a normal cord and testicle on the sound side.

---

[1] *Northumb. and Durham Med. Journ.*, January, 1900, p. 107.

The direct variety is much less common than the oblique, and only occurs in patients beyond the prime of life. The direct is globular, the oblique pear-shaped. The direct seldom reaches into the scrotum or attains enormous size. In thin, flaccid subjects the deep epigastric artery can be felt pulsating on the outer side of the orifice of exit of the direct, and on the inner side of that of the oblique variety; and the finger goes direct into the abdomen, or takes the oblique course of the inguinal canal. During operation the sac of the direct variety is often found to be loaded with an excess of subperitoneal fat, and it has never the same intimate relation with the spermatic cord that the oblique hernia has. The conjoined tendon is likewise stretched or thinned so as to be useless as a support, and possibly inefficient for the radical cure.

If the signs of hernia are not straightforward, the diagnosis requires further consideration.

A bubonocele, or hernia limited to the inguinal canal, may be mistaken for any of the following:—

1. *Undescended testicle.*—Confusion with this will not occur if a rule be made to examine the scrotum in every case. It must, however, be borne in mind that a hernial sac is a frequent accompaniment of an undescended testicle.

2. *Encysted hydrocele of the cord.*—This is more rounded than a hernia, and is translucent. It either feels hard from tension of fluid in the sac, or it fluctuates. It cannot be entirely reduced, and moves with the spermatic cord to which it is fixed. In cases of this kind, the patients are frequently brought by their parents with the story that they have a third testicle, which indeed the swelling often closely resembles.

3. *Swollen inguinal glands.*—These have no impulse, are totally irreducible, and feel like a conglomerate mass. A primary focus of infection may be found on the foot, the leg, or genitals, or anus. The skin over them may be red or œdematous, which is decidedly unusual in hernia.

4. *Subperitoneal lipoma.*—This is rare in this situation, has no expansile impulse, is totally irreducible, and possesses no neck.

A scrotal hernia has to be distinguished from the following:—

1. *Hydrocele of the tunica vaginalis.*—The distinguishing char-

acteristic of this, and of every other tumour of the testicle, is the possibility of feeling the spermatic cord above at the root of the scrotum. If this can be done, the tumour is not a scrotal hernia. An ordinary hydrocele is translucent and irreducible, fluctuation is present in it, and it is dull on percussion. In several of our cases both hernia and hydrocele existed.

2. *A congenital hydrocele or fluid from an ascitic abdomen.*—This disappears when the patient lies down, but, unlike a hernia, reappears in the erect posture in spite of finger pressure, and possesses all the other characters of hydrocele. In women a hydrocele of the canal of Nuck closely resembles a hernia.

3. *An iliac or psoas abscess.*—This, if it has burrowed into the inguinal canal and scrotum, somewhat resembles a hernia, and seldom a month passes without a patient coming to my wards wearing a truss on an abscess. Both have an impulse on coughing; both may be reducible. In abscess the impulse is that of fluid; there is fluctuation to be felt between the inguinal swelling, and a mass discoverable by making deep pressure from above on the posterior pelvic wall; and the cause of abscess is generally to be found in the spine.

4. *Varicocele.*—This has an impulse on coughing, and is reducible. The impulse is fluid; the swelling feels like "a bag of worms"; reduction is only possible in the horizontal posture, and moderate pressure over the external ring does not prevent return of the swelling when the patient stands up, as it would do in the case of hernia.

5. *Hour-glass hydrocele.*—This condition was found in the case of a middle-aged man, wearing a truss, who was admitted to my wards with a large reducible scrotal swelling, which showed a marked impulse on coughing. The scrotal swelling was translucent; it fluctuated, a fluid impulse being felt in it on pressure from above into the pelvis; and it was dull on percussion. Operation showed an enormous sacculated collection of fluid in the pelvis, and from this a narrow opening through the external ring into the distended tunica vaginalis.

INTERSTITIAL HERNIA.—This is frequently associated with non-descent of the testicle. It occurs in three forms. The sac may develop—(1) Between the peritoneum and the transversalis fascia (pro-peritoneal); (2) between the internal and external oblique muscles; or (3) between the aponeurosis of the external oblique and the skin. Two of these varieties may be combined, and a double sac then exists.

In addition to its pathological importance, interstitial hernia possesses considerable surgical interest; for a strangulated hernia may be present without any external swelling, or a strangulated loop of intestine may be reduced from one sac to another with the strangulation unrelieved. In performing the operation for radical cure, it happened to me, owing to the altered anatomical relations of the deep epigastric artery, to wound this vessel, and thus to convert what should have been a safe and easy operation into a serious and difficult one.

INFANTILE HERNIA.—If, in operating, a large sac be opened, which contains the testicle below and is closed above, some confusion may arise. Further search will show the evidence of a second sac, the hernial sac. It is separate from the first, and is placed in front of it; or it may surround it, or bear some other relation to it. It is now recognised that the condition to be dealt with is the so-called infantile hernia.

THE OPERATION FOR RADICAL CURE.—It is unnecessary to say more concerning the wound than this—that it is entirely unjustifiable for any operator to undertake the treatment of these cases, if he has not the confidence, begotten of knowledge, that his methods will prevent septic infection of the wound. The great majority of failures, and nearly all of the deaths following operation, have resulted from septic infection, so that it is scarcely possible to attach too great importance to the prevention of this. Any wound infections that we have experienced during the year have been limited to the skin, and have occurred in connection with sutures. In no single instance has the whole wound suppurated, and the moderate infection mentioned has not happened in more than eight cases. Neglect of the means now universally known to be essential to safe wound healing, amounts to criminal ignorance or culpable incapacity.

The operation I perform is for the most part a combination of selections from the methods of Halsted, Bassini, and Kocher, and is done as follows:—

1. The skin incision is oblique in direction, above and parallel to Poupart's ligament, in a line drawn from the pubic to the anterior superior iliac spine; it starts at the pubic spine internally, and ends externally at about the junction of the outer one-third with the inner two-thirds of this line. The fat and fascia are completely divided, and the external oblique aponeurosis is exposed. At the inner end of the wound the superficial pudic vessels are divided and clamped; near the centre of Poupart's ligament, the superficial epigastric vessels are similarly treated.

2. The boundaries of the external ring are exposed, and defined by dividing anteriorly its fascial extension on to the spermatic cord.

3. A director is passed into the external ring and up the inguinal canal, immediately under the external oblique aponeurosis (taking care to catch none of the underlying internal oblique muscle), as far as an inch external to the middle of Poupart's ligament. The point of the director is pushed through the external oblique at this point, and the aponeurosis is split up the whole length of the inguinal canal.

4. Above, the cut edges of the external oblique are caught in

tenaculum forceps and separated from the underlying muscles below; the inner edge and surface of Poupart's ligament are thoroughly defined. Having done this, the arched fibres of the internal oblique and conjoined tendon are cleared above. Lying on them or adhering to the external oblique, the ilio-inguinal nerve will be seen, and this must be preserved.

5. The coverings of the spermatic cord and of the sac are drawn forwards and from below out of the scrotum, between two pairs of clip forceps, and divided layer by layer. The sac, easily known if it has contents, will often have to be recognised by its pearly-white colour, or by its convex lower edge appearing outlined amongst the fascial coverings. The spermatic cord with the vas lies behind the sac, the vessels of the cord and the vas apart from each other, so that, if the cord is reached, the sac may be known to have been missed, and search must be made to one or other side. An inexperienced operator may encounter real difficulties in finding the sac, and I can remember seeing such a one, puzzled to find it, adopt the following ingenious expedient:—Letting the patient come partially round from the anæsthetic, he induced retching by tickling the pharynx, when the straining so caused clearly demonstrated the sac by shooting intestine forcibly into it. When the sigmoid flexure or cæcum are in the sac, and form part of its wall, they may be inadvertently opened in consequence of failure to realise that an exceptionally thick and vascular sac might be one of this character. I did it this year (see Case 7), and I have seen it done before. In other instances the bowel has been so damaged, from interference with its vascular supply, that gangrene or sloughing of it followed the operation. On other occasions, and more than once, I have seen no sac found, because there was none there. If a rule I insist upon, that the side with the hernia shall be marked with indelible ink the night before the operation, has been carried out, the wrong side cannot be operated upon.

6. As soon as the sac is clearly exposed, it is opened, and the cut edges of it are caught in catch forceps. If it has contents, they are reduced, but so far as possible this should have been done before the operation. Intestine may be quite difficult to reduce with the sac open, and the shock and danger of the operation are increased by manipulation and chilling of the exposed intestine. There is no excuse for cutting off omentum, unless it is so damaged or so hard as to be irreducible. Every bleeding point on it should be ligatured; and if masses of it have to be tied, the portions included in the ligatures should be transfixed, and very small portions taken in the ligature bite. Slipped ligatures and hæmorrhage from the omentum have caused a number of deaths. The difficulties of returning omentum ligatured in large masses have necessitated division of the hernial orifice, and have thus increased the chance of septic infection of the stump, adding

thereby to the risk of failure, and in addition to the percentage mortality of the operation. With a finger in the sac as a guide, the sac, and it alone, is peeled out of its coverings. This can be done most readily with a pair of good dissecting forceps. A mistake can arise here, from trying to take away more than the peritoneal sac. The spermatic cord lies next to the peritoneum, and difficulties arise in the isolation of this, if the outside of the sac is not closely followed. This is more especially true of congenital cases, in which the ordinary layer of subperitoneal fat is absent, and the elements of the cord are spread out; in children, too, these are very delicate. Under these circumstances it is easy to tear through or divide the vas deferens, and this accident has occurred to the most skilful operators. It can only be avoided by bearing the danger in remembrance, and by the exercise of great patience and care.

Another danger previously mentioned was particularly impressed upon me by a calamitous experience of it (wound of the bladder).

A localised fatty deposit on the inner side of the sac should suggest the urinary bladder, and it must be remembered that a diverticulum of it may be drawn out by the sac.

More than once I have seen a urinary fistula in the groin develop after an operation for the radical cure of inguinal hernia, probably owing to the ligation of a portion of the bladder along with the sac. The fistulous opening in these cases has always closed spontaneously, but the operation has failed to effect a radical cure of the hernia, from infection of the wound.

On one occasion also I operated upon a middle-aged man for the removal of a bladder stone by lithotrity. Towards the termination of the operation a large mass jammed in the lithotrite and prevented the instrument from closing, nor could I shake the body out. On forcibly withdrawing the clogged instrument, I found the cause of the difficulty to be a thick silk ligature. The history he gave was that fifteen months previously he had undergone an operation for rupture, that blood had been passed in the urine after the operation, and that some urinary trouble had existed since. His rupture remains uncured.

7. The spermatic cord is isolated by tearing through its posterior connections, and is then looped up and held forward on a blunt hook.

8. The sac is separated well into the abdomen, and the finger passed under the outer arched fibres and beneath the transversalis and the internal and external oblique muscles, up in the direction of the anterior superior iliac spine. A blunt hook drags the outer angle of the skin wound in the same direction, and a pair of suitable forceps are pushed through the muscles on to the finger. The forceps are guided by the finger down the inguinal canal, and, seizing the fundus of the sac, draw it tightly upwards

through the muscular opening. The neck so formed is securely sutured to the external oblique muscle, and the slack of the sac is then cut off.

For some three or four years I did not remove the sac, but laid it over and sutured it about the line of incision in the external oblique. In about 5 per cent. of cases the sac sloughed and caused trouble, and, after recurrence of the hernia into the old sac in two cases, I abandoned this method, as also a plan which I occasionally adopted of using the sac as a suture for the external oblique. In congenital cases the sac is cut through above the testicle, and the upper portion is treated in a similar way to an ordinary sac. The lower portion of peritoneal sac surrounding the testicle is left open, as I found, in my earlier experience, an occasional hydrocele develop in cases where it had been closed by a fine continuous suture.

When the testicle is undescended, it is taken away along with the sac, if the opposite one is a normal organ. If not, the testicle is drawn down into the scrotum; or, if this cannot be done, reduced into the abdomen and retained there.

In the case of a middle-aged man, with hernia complicated by undescended testicle, I ligatured the cord and the hernial sac together. On visiting him two hours after the operation, I found him very ill, and obviously suffering from hæmorrhage. Nothing was to be seen externally, but on opening the wound it was clear that the spermatic artery had slipped from the ligature and was bleeding still. His abdomen was full of blood. With the help of a nurse, who administered the anæsthetic, I had to open his abdomen to wash it out, and to secure the spermatic artery. After an hour of the hardest and most anxious work I ever had, the operation was completed to my satisfaction. My efforts were rewarded by the man's recovery. Ever since, the divided spermatic cord has received most careful attention from me.

9. The arched fibres of the internal oblique, and the conjoined tendon, are sutured under the cord to the deep part of Poupart's ligament. In carrying out this part of the operation, the proximity of the external iliac vessels must be borne in mind. The artery can be felt beating close to and under the centre of the ligament; the vein lies on its inner side. To do this part of the operation safely, it would be well for the beginner to fix and draw forward Poupart's ligament with catch forceps before passing the needle through it.

For the muscular sutures I always use chromicised No. 8 catgut, *i.e.* No. 19 of standard wire gauze, and an ordinary Hagedorn needle, or one of my own pattern resembling it. The upper suture does not pass under the cord, but above it, leaving only a sufficient muscular opening for the cord to pass through. In direct hernia, or in old-standing cases, when the opening is large and the conjoined tendon too much displaced or inefficient, the inner half of the canal is closed by transplantation of the rectus muscle, the outer portion of the sheath of this muscle being opened and the muscle drawn down to Poupart's ligament by sutures replacing or strengthening the conjoined tendon. The inguinal canal is thus entirely closed except where the cord emerges, and the cord itself rests on the muscular floor so formed. The ilio-inguinal nerve is displaced either upwards upon, or under, the muscles previous to their suture.

10. The incision in the external oblique muscle and aponeurosis is closed over the cord, leaving an external ring only large enough for its exit by interrupted sutures of No. 4 chromicised catgut, *i.e.* No. 23 standard wire gauze, the cord being drawn down by dragging on the testicle through the scrotum.

11. The subcutaneous fat and deep layers of the skin are tacked down by three or four sutures to the external oblique.

12. A subcuticular suture of fine catgut closes the skin wound entirely.

During the operation all bleeding points are carefully picked up and secured by torsion or by a fine catgut ligature.

On the day following, an elastic spica, or St. Andrew's cross bandage, is carefully applied over the dressing, which is then left unchanged for ten days. The patient should be kept in bed for three weeks, and from heavy exertion for three months. No special after-treatment is required, though occasionally retention of urine may necessitate the use of the catheter.

In the female the steps of the operation are similar, except that the round ligament is left undisturbed, and the internal oblique and conjoined tendons are sutured over instead of under it. In children the cord is not displaced, and is treated in the same way as the round ligament in the female, *i.e.* placed *under* the muscle. We have found that it is not sufficient in them to remove the sac only.

FEMORAL HERNIA.—(A) *Diagnosis.*—It is rarely met with in children, and is not common in men. The swelling is seldom large, rarely exceeding a Tangerine orange in size.

It may be confounded with the following:—1. *Superitoneal lipoma.*—This, with which a hernial sac is here often associated, closely simulates femoral hernia, but the impulse on coughing is absent, and it is irreducible. The same is true of a hernia containing adherent omentum, but the pedicle, absent in lipoma, can be traced into the femoral ring.

2. *Enlarged glands.*—These are firmer than a hernia, and if they can be raised up are found to have no pedicle. A primary infective focus may be discoverable. If a femoral hernia suppurates,—a rare event,—diagnosis from inflamed glands may be impossible.

3. *Psoas abscess.*—This often resembles very closely a femoral hernia. It may be traced back under the femoral vessels to their

outer side; it fluctuates from the abdomen to the thigh, and its spinal origin may be evident.

4. *Femoral or saphenous varix.*—During the last quarter of the year I saw a patient who had worn a truss eleven years for saphenous varix, and the diagnosis had not been questioned till the time of my visit, when the varix had become thrombosed. The impulse in varix is a fluid thrill, and though the swelling disappears on assuming the horizontal posture, unlike a hernia, it reappears when the patient stands, in spite of a restraining finger over the femoral canal.

(B) *Treatment.* — A satisfactory truss is more difficult to obtain for this than for inguinal hernia; the risks of strangulation in consequence of this and of the narrow, rigid opening through which the bowel passes, are greater, and the probabilities of cure by truss treatment are very small. Unless there are good reasons against it, operation should therefore be advised.

The operation I have adopted in ordinary cases is as follows:—

1. An oblique incision below and parallel to Poupart's ligament, exposing the sac.
2. The sac is opened, and its contents, if any, are returned. Rarely an ovary, or the cæcum and appendix, and still more rarely the bladder, may be found.
3. The cut edges of the sac are caught in clip forceps, and, with a finger in the sac, it is stripped out by a pair of dissecting forceps until the neck of the sac is drawn well out of the canal.
4. The sac above its neck is transfixed by sinus forceps, and tied with thick catgut and a Staffordshire knot.
5. The femoral ring is closed by catgut sutures through Poupart's ligament in front and Cooper's ligament behind. If the needle passes down to the pubic bone behind, Cooper's ligament cannot be missed. The ring is closed by tying these sutures as firmly as possible without damage to the femoral vein, which lies immediately to the outer side of the last suture.

The most curious case that has come under my care for radical cure was that of a healthy woman, sent by Dr. Thomson of Gateshead. The history she gave was one of strangulated hernia, followed after a serious illness by spontaneous relief and discharge of fæcal fluid through the groin. A partial enterocele had become gangrenous, an abscess had formed and burst, and her life was saved by the formation of a fæcal fistula. This is more likely to occur in the femoral region than elsewhere, because it is chiefly here that small portions of the bowel wall only are likely to become strangulated. When I first saw her, the appearances were remarkable. Hanging from her groin was a long sausage-shaped swelling, reaching well down the thigh, and this was in constant movement. It was a coil of intestine, prolapsed and turned inside out through an intestinal opening adherent to the skin, covering a large femoral hernia. An operation for the repair of the fistula, and radical cure of the hernia, was, and continues to be, entirely successful, ten years later.[1]

In unsatisfactory subjects, such as those possessed of the hernia conformation of Lockwood, or in whom the hernial orifice is of large size, the simple operation described above may be replaced by one more complicated. In them I perform the operation described by Mr. Parry of Glasgow, the principle of which is similar to that described for inguinal hernia. The conjoined tendon and arched fibres of the internal oblique, after being exposed in the inguinal canal, are drawn down from above and sutured to Gimbernat's and Cooper's ligaments below, thus closing entirely and from above the femoral canal. The principle of this operation is so good that failure is improbable, but a sufficient time has not yet elapsed since the operation was published for me to offer statistics as to permanent results.

(*To be continued.*)

ON THE TREATMENT OF CLEFT PALATE.

By W. Arbuthnot Lane, M.S., *Surgeon to Guy's Hospital, and to the Hospital for Sick Children, Great Ormond Street, London.*

Several years have elapsed since I first suggested and carried out operations for cleft palate as early after birth as possible, and as I have operated two or three hundred times on these cases, I think it may be worth while placing before you some of the methods which I have found most serviceable under varying conditions.

I will first briefly state my reasons for operating at a very early period.

The best time is the day after birth, or as soon after that as possible. The newly-born child is always healthy, the capacity of its tissues to repair being at the very best, its digestion has not been impaired by experimental and usually most unsatisfactory feeding, and its resisting power reduced correspondingly; it is apparently uninfluenced by the operation in that it does not cry or show evidences of being in pain; it is never or hardly ever sick after the anæsthetic, but takes its food within an hour or two of the completion of the operation with apparent enjoyment; the loss of blood is very slight, being usually much less than in the case of a circumcision, and the risk to life is very trivial indeed.

At this period it is possible to provide a well vascularised thick flap, which is practically three times as broad as can be obtained when the teeth have begun to encroach materially on the mucous membrane or to perforate it, since the muco-periosteum covering the under and the outer surface of the alveolus can be made to form the outer two-thirds of the flap.

---

[1] *Northumb. and Durham Med. Journ.*, January 1, 1903, p. 121.

By separating the mouth from the nose, the breathing air being transmitted through the latter only, the factor upon which the development of the naso-pharynx depends for its development, namely, the to and fro passage of the air through the nose alone, is enabled to exert its influence on the development of the lumen of this passage, and indirectly upon that of the upper jaw and of all the bones of the face, at a period of life in which change takes place most readily.

The general principle on which most of the operations are based is that of raising from the roof of the mouth on one side of the cleft a flap, which consists of the mucous membrane, submucous tissue, and periosteum of the roof of the mouth, and where this flap extends over the alveolus, care is taken to avoid unnecessary damage to the subjacent teeth. This can only be done efficiently very soon after birth. As time goes on, the damage done to the temporary teeth by the separation of the superjacent mucous membrane becomes steadily greater. Still this is a matter of no very great moment as compared with the importance of the closure of the cleft. This flap has its attachment along the free margin of the cleft.

In the soft palate, the flap, which is raised, comprises all the soft parts down to the tensor palati, and may be made as extensive as necessary by encroaching on the cheek if there is not enough material in the remains of the soft palate. As regards the soft palate, this method of operating is *incomparably more certain of success than the usual mode of paring the edges of the cleft and bringing them together.* This last is only rendered possible by the free vertical division of the palate muscles on either side, and the junction so effected frequently breaks down. In my operation the continuity of these muscle planes is unimpaired, no cicatricial tissue existing in their substance, and no loss of function arising in any part in consequence; the muscles on either side being connected by material on which they can exert efficiently their traction normally in their several directions. On the other side of the cleft, the muco-periosteum is divided along its free margin till the soft palate is approached. The extremity of the uvula or its relic is picked up with forceps, and an incision is made outwards from it along the free margin of the palate for some distance, and from its outer limit another is carried forwards and inwards along the upper part of the soft palate to reach the posterior limit of the incision running along the free margin of the hard palate. The triangular flap of mucous membrane, and submucous tissue intervening between the two incisions described, and the margin of the cleft in the soft palate is raised off the subjacent muscles and turned inwards, and the raw surface left by doing so is increased in area by turning outwards a further portion of the mucous membrane covering the soft palate externally. By this means the area of the upper surface of the soft palate, rendered bare by the removal of its mucous covering, is rendered much greater than before. By means of a stout steel elevator introduced between the muco-periosteum and the bone through the incision made along the margin of the cleft, the muco-periosteum is raised from the bone up to the inner margin of the alveolus. The flap, whose edge is attached along the margin of the cleft, is placed beneath the flap which has been raised from and for a considerable distance beyond the margin of the cleft, and it is pinned down by fine curved needles and 0000 Chinese twist silk in this position by a number of sutures, which perforate the free margin of the reflected flap and the outer part of the elevated flap, the knots being tied on its under surface of the latter, whence they can be removed with facility when the opposing surfaces have united firmly, which they do in about ten days.

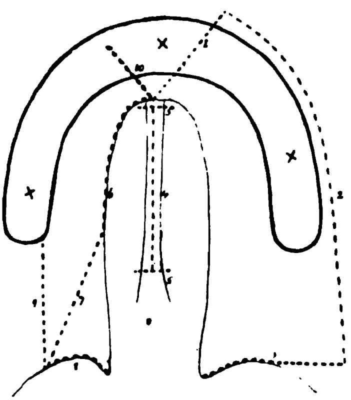


Fig. 1.

Then the free margin of the raised flap is attached by separate sutures to the raw surface of the reflected flap. Finally, the opposing edges of the free margin of the soft palate are united in a similar manner.

In Fig. 1 I have attempted to indicate diagrammatically the details of the method I have described. It is intended to represent the roof of the mouth of an infant, showing a broad cleft involving almost the entire palate. The position of the alveolus is indicated by the three crosses x x x. 1 represents the incision, which extends forwards and outwards through the muco-periosteum from the anterior limit of the cleft, and which passes over and beyond the alveolus to its outer surface; while 2 commences at its outer limit and runs back along the outer surface of the gums about the junction of the cheek and alveolus. An incision (3) is then made from its posterior extremity along the free margin of the palate to the uvula. The flap included between these incisions is raised from the subjacent structures, a specially designed small knife, or a carefully constructed pair of sharp-pointed scissors being used for the purpose. As the posterior palatine foramen is approached, an elevator pressed in between the flap and the bony palate causes the posterior palatine vessels and nerves to protrude for a considerable length in a tube of periosteum. This is readily grasped by a pair of efficient compression forceps and divided beyond. I particularly use the term "efficient" compression forceps, since almost all those made are only of use to control hæmorrhage while they are attached. A forceps to be efficient should exert on the structures compressed between the blades a pressure sufficient to control the bleeding on its removal. An instrument effecting this purpose has been made for me. It is furnished with terminal teeth, which are of immense advantage in the general use of the forceps, for the reason that the points on the surface on which the teeth impinge are caught by them, and the whole of the soft parts intervening between the points of primary contact is drawn up between the blades. After using these forceps, the ordinary smooth-nosed Spencer Wells forceps seems a hopelessly clumsy and useless implement.

It happens not uncommonly in the type of cleft palate illustrated by Fig. 1, that the septum presents a free margin which extends almost if not quite to the level of the cleft. In these cases I make an incision (4) through the mucous membrane and periosteum or perichondrium along the middle line of the septum with two small transverse incisions (5) at either end, and turn down laterally the narrow flaps so formed, leaving the cartilage or bone bared and exposed. By placing the flap, which has been raised in position, the line along which it will rest on, the septal margin can be readily defined. With a sharp knife the surface of the mucous membrane is denuded of its covering of mucous membrane along the area of impact. By a series of sutures perforating the superjacently impaired flap and the margin of the septum if it be not too hard, or the flaps of muco-periosteum if the edge be bony, the reflected flap is pinned securely to the septum. 6 shows the incision along the free margin of the cleft continued as 7 obliquely outwards and backwards along the upper surface of the soft palate. The incision 8 extends from the posterior limit of 7 along the lower free margin of the soft palate to the tip of the uvula, and the incision 10 forwards and outwards from the anterior limit of 6 on to the alveolus. This last incision facilitates the raising of the flap on this side, and of the introduction beneath it of the reflected flap from the opposite side. After the muco-periosteum external to the incision 6 has been raised from the bone, the soft palate is freed from the posterior margin of the hard palate, and the mucous membrane on its upper surface turned outwards to the position of 9.

In Fig. 2 the flaps are shown in position. The sutures along the line 1 represent those attaching the septum to the reflected flap. Those along 2 show the sutures which unite the free edge of the raised flap to the under surface of the reflected flap; those along the line 3 anchor the edge of the reflected flap, and those along the line 4 connect the flaps where they form the free margin of the new soft palate.

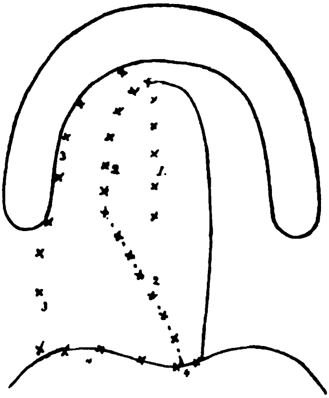


FIG. 2.

It would be impossible to perform such an operation with the large, clumsy, coarse instruments in general use which are called cleft palate needles, since they would tear the flaps to pieces, but it can be done readily and skilfully by means of the little needles and needle-holder I devised for the purpose. The needles are straight and curved, the curved being of two varieties. The forceps which I find most useful I got made with terminal teeth and approximation plates, which can hold flap, needle, or thread with equal security. Their breadth varies according to the number of teeth, and the operator should be provided with several sizes. The gags which I have always found most efficient I devised when I commenced these operations, as none of those in use at the time were effective, being all too large and clumsy and insecure. They have teeth, which bite into the gum to which they are attached most securely, and they are easily removed. The plates carrying these teeth are very small, occupy very little space, and do not get in the way of the operator. These gags are made in pairs and in several sizes.

Another common type of cleft palate is that illustrated in Fig. 3, the cleft in front being to one side of the middle line extending from between the septum and a portion of the roof of the mouth, while posteriorly the cleft in the soft palate is pretty symmetrical.

As the mucous membrane is always very thin where it covers the septum and the adjacent portion of the roof, the flap must be reflected inwards from the narrow or less developed side and raised outwards from the septum, the narrower flap being fixed beneath the muco-periosteum covering the broader side of the roof of the mouth.

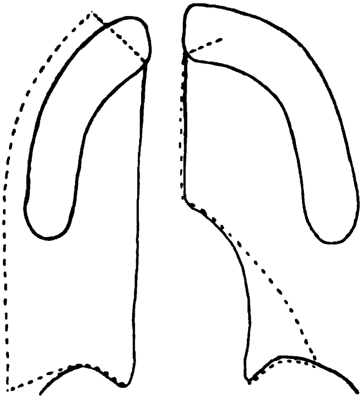


FIG. 3.

Associated with a complete cleft of the palate there is often a displacement forwards of the premaxilla, which is attached to the under surface of the septum beneath the tip of the nose. This should be dealt with very carefully. I have found it best to divide the mucous membrane along the limits of the premaxilla, laterally and posteriorly avoiding any interference with the soft parts in front. The muco-periosteum is separated from the subjacent premaxilla and is reflected forwards. The premaxilla is cut away from the septum by means of biting forceps, the edge of the septum being nicely trimmed and rounded.

This flap, which consists of a mesial relic of lip and of muco-periosteum, is opened out when it covers a considerable area. Its margin is attached by sutures to the raw under-surface of the reflected flap, and to the raised flap, which is rendered raw where the premaxillary flap covers it by the removal of its epithelial covering by means of a sharp knife. In this way the gap between the alveolar segments is filled up very advantageously, and later

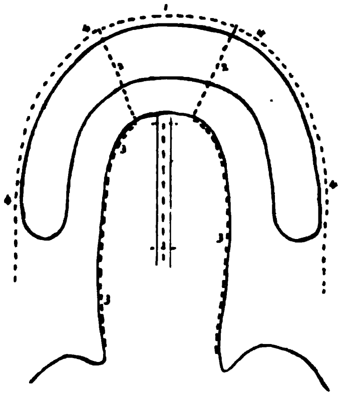


FIG. 4.

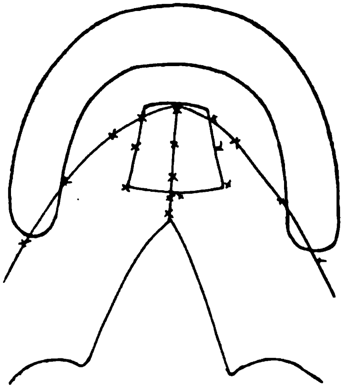


FIG. 5.

when the cleft in the lip is closed, the mesial relic of the lip serves to complete the septum and to afford attachment to the lateral margins of the cleft.

It happens not infrequently that it is impossible to close the whole length of the cleft by one single operation.

Fig. 4 illustrates such a condition. The cleft is a very wide one, and it is impossible to close it by the reflection of flaps in the manner described. An incision is made along the entire outer aspect of the gum along the line indicated by 1. Two are made along the direction of 2, and two others along the free inner margins of the cleft.

The flap included between 1 and 2 on either side is turned back, great care being taken of its attachment, which is usually very thin. The flaps comprised between 1, 2, and 3 are raised from before backward, care being taken to avoid any damage to the descending palatine vessels. These flaps are then displaced inwards, as in Fig. 5, their apposing margins being sutured together and to the subjacent flap, and if possible to the septum also.

At a later period the posterior portion of the cleft may be closed in one of two ways, the method varying with the breadth of the cleft and the extent of material at disposal. One is by reflecting a flap inwards on one side, leaving it attached by its inner margin, the outer flap being rendered raw on its posterior surface and its area extended as before, or it is raised from the subjacent parts by an incision extending along its inner, posterior, and outer margins, so that it pivots anteriorly, and can be made to cover the flap reflected from the opposite side. Or both flaps may be made to pivot upon their anterior attachments, their internal edges are sutured carefully together, the outer free margins being anchored wherever a suitable attachment can be found.

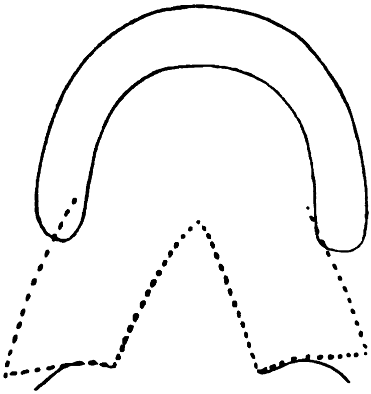


FIG. 6.

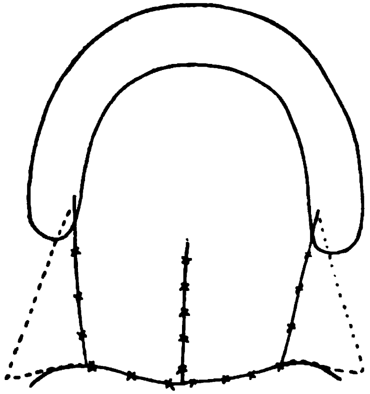


FIG. 7.

The free inner margins of the cleft are also pinned down to the superjacent flaps by sutures.

In Fig. 6 I have indicated the mode of closure of the back of the cleft by raised flaps, the outlines of which are represented as dotted lines, and in Fig. 7 the suturing of the raised flaps on both sides in position. In order to avoid confusion, the knots of the sutures which attach the inner margins of the cleft to the superjacent flaps are not indicated in this diagram.

In this diagram the outlines of the flaps are represented as firm lines, the dotted lines representing the position of the incisions, and show portions of the area deprived of mucous membrane, and uncovered by the flaps, which have been brought inwards so as to appose their inner margins.

There are many other conditions which may arise to render operative interference difficult, and which can be met only by delicate manipulation and a ready application of the method which seems most applicable to the particular case. The surgeon must always bear in mind that the longer the operation is postponed, the greater are the difficulties he will experience, these being enormously increased by dentition, the greater the risk to the life of the patient, and the smaller the benefit which will be derived from the point of view of speech, development of the naso-pharynx, and deformity.

As regards the treatment of the infant after the operation, beyond ensuring that the hands cannot be introduced into the mouth, no change whatever in diet is adopted, nor is any attempt made to sponge or spray the interior of the mouth. At the end of about eight or ten days, the stitches are removed. Should a cleft in the lip complicate that of the palate, the former is closed as soon as the palate has been dealt with.

THE CAUSES, PATHOLOGY, AND TREATMENT OF CHRONIC RHEUMATISM.

By Ralph Stockman, M.D., *Professor of Materia Medica and Therapeutics in the University of Glasgow; Physician to the Western Infirmary of Glasgow.*

(*Concluded from page* 116.)

Symptomatology.—In considering the etiology of chronic rheumatism, I mentioned feverish attacks accompanied by muscular pains as one of the causes. In text-books this is often called "acute muscular rheumatism," and in practice "influenza." As it is probably a frequent, if not the most frequent, cause of inflammation of the muscle connective tissues, a short description of its symptomatology may not be out of place here. Nothing is known regarding its bacteriology, but as it is so constantly accompanied by sore throat, the idea inevitably suggests itself that the original infection is situated in the throat, and that the local irritation of the fibrous tissues is due to a toxine absorbed from there. This, however, is only a hypothesis. It may be due, as Leube has suggested, to an attenuated form of the microbe which is the cause of acute articular rheumatism.

Acute Muscular Rheumatism.—After exposure to damp cold and a preliminary feeling of malaise and chilliness, pain and aching are felt in the muscles and bones, and often slightly in the joints. The pain may be so severe as to prevent the patient moving, or there may be merely a feeling of tiredness and stiffness sufficient to make any exertion unpleasant. Neuralgia may be present in one or more nerves, and may cause severe suffering. Often there is no rise of temperature, or it may be very slight, there is some disturbance of appetite and digestion, and usually some deposit of urates in the urine. There is often intense sleepiness, or a heavy dull feeling, and a sense of vague cardiac discomfort which sometimes amounts to slight faintness. Pharyngitis or tonsillitis are very often present, but not invariably. The symptoms usually begin about eight to twelve hours after exposure to cold and wet, and they pass off in a few days. During the acute stage the fibrous tissues of the muscles, bones, and joints are distinctly painful to touch or pressure at certain places, and at these places slight doughiness or marked œdematous swelling can be made out. It presents all the characters of a specific fever of short duration, but whether of truly rheumatic, influenzal, or unknown origin, it is impossible to determine definitely. It certainly bears a close resemblance to acute articular rheumatism, but the duration is shorter, and it is not controlled by salicylates with the same decisiveness and rapidity.

CHRONIC RHEUMATISM.—When numerous fibrous indurations have been developed throughout the body, the exciting causes previously described, especially damp and over-exertion, bring on severe attacks of muscular pain and aching, which may also involve various joints and fasciæ, but, instead of passing off in a few days, each attack may continue for weeks, the more acute symptoms of an exacerbation being followed by almost continual aching and stiffness. In severe cases the patient is thus never quite free from stiffness, aching, and pain, and is always liable to an increase of them on any exposure. Their severity and extent depend on the degree to which fibrous strands, thickenings, and nodules have become developed in the affected tissues. In certain patients it may recur again and again in the same part, as in the muscles of the back (lumbago), neck (stiff-neck), shoulder, legs, etc. Very often only the particular part suffers which has been specially exposed to a draught or to severe exertion, or it may be much more general, or rarely, the periosteal tissues may be chiefly affected.

The chief symptoms are pain, aching, stiffness, a readiness to feel muscular fatigue, interference with free muscular movement, and very often a want of energy and vigour.

The pain may be dull and continuous, or sharp and shooting, or a mixture of both. It is often very severe on any sudden movement which compresses the swollen indurations, as happens frequently in the lumbar region or in the deltoid, especially after the parts have been at rest. More often, perhaps, it is a dull continuous aching or feeling of stiffness and weight, usually worst when warm in bed, or on awakening in the morning, or after resting a part for a time in one position, or after sleeping during the day. There is a dragging feeling of fatigue, and a disinclination for muscular exertion. The aching wears off on active exertion or on vigorously rubbing the parts. All these symptoms tend to be more marked in damp weather. The patient often has difficulty in locating the exact spot of the pain or aching, as these may radiate over a wide area, but on palpation it can be readily made out that certain places are swollen, tender, and often very painful on pressure.

The joints are not infrequently affected at the same time as the muscles, but never seriously as in acute rheumatism. One or two joints may be very slightly swollen, but usually they are merely stiff and perhaps a little painful.

Interference with the working and staying powers of the voluntary muscles is often a very marked feature.

The sudden pain often felt on movement of the muscles of the back or shoulder may be crippling in its intensity, but apart from this, the muscles are easily tired. The constant aching, stiffness, and tired feeling form a bar to active or continued exertion. The intolerable and prolonged stiffness and aching, which often ensue after athletic exercises and games, usually cause a disinclination for any exertion of the kind, and the person gradually tends to become more and more sedentary in his habits.

During an exacerbation the digestion is often out of order. The tongue may be clean and the appetite fair, but there is often flatulence and a dull headache with temporal neuralgia. There is often almost continual slight sore throat along with these exacerbations.

If a nodule press on or implicate a nerve, severe neuralgic pain, radiating widely and often far away from the nodule, may be present. Occipital neuralgia is often due to a nodule in the neck, brachial neuralgia to nodules in the upper arm and sometimes to an induration close to the spinal border of the scapula, sciatica is often caused by nodules in the buttock, while temporal neuralgia is frequently present and is apparently due to swelling of the nerve sheath. Numbness, prinkling, and a sense of weakness are other symptoms of implication of nerves.

Weakness of the back, aching in the fascia lata, and the symptoms which have been called "spinal irritation" are often due to these fibrous indurations. When there are many indurations, the suffering may become practically constant, with exacerbations on exposure to wet, draughts, fatigue, and indigestion. The general health and nutrition may then be mediocre, there is a loss of energy, frequently depression of spirits, and a tired look in the face. In a case of moderate severity the patient looks quite well, is well nourished, and often works hard.

In severe cases, and especially if there be much neuralgia, digestion and nutrition are very poor, and there may be a good deal of emaciation and neurasthenia, sometimes so much that the patient is a complete invalid. In many women who are regarded by their friends as martyrs to neuralgia, and as hopeless neurasthenics, and who have all the concomitant symptoms of these conditions, the original cause of all their ill-health is found to depend on a widespread development of these fibrous thickenings throughout the body. In men also I have seen a considerable degree of neurasthenia induced, but not to the same extent as in women. The heart and arteries do not become secondarily affected in any way, so far as I have been able to judge.

Physical Examination.—During an acute attack the muscles are tender on pressure and feel doughy at the affected parts, but no indurations can be made out, unless they have been there previously.

On examining a chronic case, the indurations may sometimes be felt quite plainly and are painful on pressure, but for a satisfactory examination it is better to thoroughly smear the skin with liquid paraffin, vaseline, or some fat. The muscles of the part should be relaxed as far as possible. The thumb or tips of the fingers are then passed over the skin with firm, gentle pressure, and the more superficial nodules and indurations can be readily felt. Some of the indurations are soft and ill-defined, giving the impression that they consist largely of serous exudation; others are more fibrous and hard. Some are scarcely palpable fibrous cords, often very tender along their whole extent. Occasionally they are like a chain of small-shot or beads running along the side of a muscle or aponeurosis or under the skin. They can often be very easily felt on the periosteum of the ribs. They are tender on pressure, especially those situated just under the skin. It is difficult at first to locate them all, often deep pressure is required, but after a few days of massage they swell and become more painful on pressure, and are then much more easily detected. In very chronic cases, involving a large area of subcutaneous tissue (as in the loins or shoulder), the induration may be general, and, being situated just under the skin, gives the latter a resistant, brawny, and inelastic feeling. When the subcutaneous tissue is thickened in this way, the ordinary tactile sensibility of the skin is dulled, and even a strong faradic current can sometimes be scarcely felt.

The commonest situations for these indurations are in the lumbar aponeurosis, the calves, fascia lata and tendinous expansions of the thigh muscles, the trapezius just above the supraspinous region, the insertion of the deltoid, the inner border of the biceps and its long head, the intercostal and pectoral muscles, the glutei, and the soles of the feet.

The fibrous tissues round the neck of the bladder, of the pharynx and œsophagus, behind the sternum, all along the spinal column, and of the joints, may also be affected, giving rise to dull or acute pain in these situations. The anterior abdominal muscles are very seldom affected, those of the forearm, hand, and anterior aspect of the leg infrequently, except at the origin of the supinator longus muscle.

The symptoms arising from implication of the fibrous tissues about the bladder and thorax often cause much mental anxiety to patients. In the case of the bladder the symptoms consist in dull pain and increased frequency of micturition, but they usually pass off in a week or thereabouts. When the intercostal muscles and the fibrous tissues of the ribs and sternum are affected, each respiration may cause pain or discomfort, and if the respiration be deepened or accelerated by ascending a hill or a stair, the pain may become acute, and darting or stabbing in character.

When the fibrous tissue behind the pharynx is affected, the symptoms are chiefly subjective. The patient feels as if the parts were slightly swollen, stiff, and uncomfortable, but little or nothing can be made out on inspection.

Treatment.—ACUTE MUSCULAR RHEUMATISM.—As previously stated, it is not known whether the pains in the muscles and bones are due solely to a true rheumatic infection, or whether they occur with several febrile conditions. The general treatment is that of a slight feverish attack, and recovery takes place in a few days. If the pains are widely spread over the body, rest in bed, light diet, saline purgation, mild diaphoretics (liquor ammonii acetatis, spiritus ætheris nitrosi, Dover's powder), or mild alkaline diuretics, hasten recovery and give ease to the patient. Sodium salicylate, alone, or with phenazone or phenacetin, greatly relieves the pain and aching; or methyl salicylate may be applied locally. The salicylates, however, do not exercise the same immediate specific action which they show in acute articular rheumatism. A hot bath, followed by a copious perspiration, or a Turkish bath, with well applied massage, if taken in time, may abort the attack.

Very often in such an attack the chief site of the pain is localised to the lumbar region, to the shoulders, neck, chest wall, or lower extremities, and in these places the actual painful area is often comparatively small and results from serous exudation. This is best treated by massage, followed by passive and active movements. One thorough application of massage may result in cure, or several may be required. The parts are very tender, and the manipulations must be begun very gently by stroking so as to get rid of the exudation and relieve tension; gradually, more severe pressure can be borne, first with the palm of the hand, and then with the fist or knuckles. This is followed by passive and then by active movements appropriate for each part. The local inunction of methyl salicylate, alone, or mixed with an equal part of liquid paraffin, often relieves the pain, or a 10 per cent. solution of menthol in liquid paraffin may be used. Mustard leaves and other local irritants are also beneficial.

CHRONIC RHEUMATISM.—Where fibrous indurations and nodules are present, satisfactory treatment is much more difficult and prolonged. During an acute exacerbation, when the indurations swell up and cause pain and aching, these may be relieved by the measures just described. But the relief thus afforded is only temporary, and in a few hours, or as soon as treatment is stopped, the pains return, to continue for days, weeks, or indefinitely. Besides, the patient remains liable to attacks on every exposure to cold, wet, or fatigue. To obtain permanent cure and complete relief from the recurrent attacks, the fibrous indurations must be completely dispersed, and in all but quite recent cases this is always a more or less tedious and troublesome procedure. The only means which I have found of special value are massage and exercises, the faradic current, and the injection of solution of chromic acid into any of the fibrous nodules which are sufficiently defined to allow of this being done. Of the three, massage is the most important and the most efficacious.

Massage.—General massage is of no use. Treatment must be specially directed to any nodules and indurations which can be felt, and to parts which are painful. In many cases, especially in the lumbar region and in the fascia lata, although pain and aching are present, no special thickenings can at first be made out, but after being rubbed for a few days, certain places become swollen and painful, and the exact seat of the lesions can thus be located. Sometimes, however, in these aponeuroses and elsewhere, the thickening is slight and widespread, it cannot be located for special treatment, and then it is more difficult to get rid of. Frequently, too, the thickenings are deeply situated in the intermuscular septa, or in the capsules of the joints, or in the periosteum, and are not easily reached. In carrying out massage, the muscles of the part should be relaxed, the skin should be smeared with liquid paraffin, or some oleaginous substance, and, if necessary, the hairs shaved off. At first the massage should not be too severe, as it is thus apt to irritate the indurations and to cause too much pain and subsequent stiffness. After a few days of treatment, the fibrous thickenings become more painful and defined, and in old-standing cases many of them are only then detected. Once their number and situations are known, treatment may be directed to them more particularly. For the first week or ten days, or even a good deal longer, they are very painful when manipulated (the subcutaneous ones often exquisitely so), and hence the treatment has to be carried out judiciously; but after a time they begin to shrink in size, and become more fibrous and callous. Much more pressure can then be exerted on them, the fist or the knuckles being used, and in process of time they become quite small and hard, and ultimately disappear entirely. The massage should be carried out daily, ten or fifteen minutes or more being devoted to each region affected; at the beginning and end about two minutes of gentle effleurage should be given, as it soothes the parts and removes serous engorgement. When the nodules are large, well-defined, and few in number, treatment can be carried out on the dry skin or through thin underclothing; but if the induration is widespread, or the nodules small and numerous, the whole part must be rubbed on the bare skin and with some lubricating material. The rubbing should not be too severe, especially at first, as the indurations become thereby very sensitive to pain, and time is lost rather than gained.

To obtain satisfactory cure, the dispersion of the indurations must be complete, otherwise relapses occur, and these are a source of much disappointment. The length of time required to effect this varies very much. Recent soft thickenings can be dispersed in from one to three weeks. A very common time is six to eight weeks; but some cases, and these are not infrequent, require treatment for six to twelve months. In such old-standing cases some of the indurations are got rid of much earlier than others, and if these have been a source of aching and pain, considerable relief is afforded even by a partial cure. Some nodules become very hard and fibrous, and fail to be dispersed by the most persistent and severe rubbing. The rapidity of dispersion depends on other circumstances also. If the nodule can be forcibly compressed against a bony part (as in the upper arm), more effective pressure can be exerted, and it is much sooner got rid of than if it lies deeply buried among fleshy muscles, or alongside the spinal column where it is difficult to reach. This is illustrated by many cases of sciatic neuralgia. If the sciatica be due to a nodule in the buttock, cure is not so difficult; but if the thickening is in the sheath or in the bed of the carefully protected nerve, it is difficult to reach, and can scarcely be cured by massage. Deeply placed nodules in the sole of the foot, in the tendo Achillis, and at the side of the spinal column, are often impossible to disperse. It is best to have an experienced rubber for some weeks at least, or until the painful stage is past and the indurations have been located. After that, treatment may be carried on by an intelligent person who is strong enough, or by the patient himself for some parts of the body. In many cases the treatment required is so prolonged, and small indurations are so often overlooked and left untreated by the masseur, that it is necessary to instruct the patient himself how to treat them when they begin to ache and give trouble. The treatment of fibrous indurations connected with the joints is conducted on the same principles—hard massage with passive and active movements.

Exercises.—The movements should be such as are best calculated to exercise and stretch the muscles and aponeuroses involved. They can be easily devised without apparatus, or better with the aid of a stick, dumb-bells, Indian clubs, and Sandow's exerciser, and should be carried out for half an hour or more daily.

Historical Note.—These methods are by no means new. Without going further back than last century, similar treatment was described in detail by Dr. William Balfour (1816). His method was by "friction, percussion, and compression" (bandaging), and he applied it with great success to the treatment of rheumatism of joints, sprains, and muscular pains. He held that the frictions and hard pressure remove the tension in the aponeuroses which is the cause of the pain, and he also emphasised the value of percussion. "If to a tumour recently formed, the consequences of either a violent sprain or of rheumatism, compression either by friction or bandages, or both, is applied, the swelling immediately subsides, and the motion of the parts becomes free." "Bandages and friction produce their beneficial effects by promoting circulation in the capillaries, and absorption of effused humour." He reports a number of cases to illustrate his methods of treatment, some of them very severe and of long duration, but with which he was remarkably successful. He says, "I venture to assert that in the great majority of cases lameness arising from rheumatism in parts susceptible of compression must be attributed, not to the irremediable nature of the disease, but to those concerned in the treatment—the patient or the practitioner."

Scudamore says it is often impossible to effect cure or improvement in chronic rheumatism without the aid of friction and shampooing. "It tends to excite a better circulation, especially in the veins, to give more tone to the muscular fibre, to overcome rigidity of parts, to stimulate the absorption of synovial secretion or of effusion." He does not, however, show the same practical grasp of the method, nor the knowledge of details, which Balfour does.

In more recent years, Berghman, Helleday, Ewer, Hackenbruch, Strauss, and others have insisted on the value of systematic massage in dispersing these fibrous indurations.

Faradism.—The faradic current should be applied over each affected region for five to ten minutes daily, and should be as strong as can reasonably be borne. It is a useful adjunct to massage treatment, but is not so powerful. Its action can be best studied in the circumscribed indurations which lie under the skin. Probably it scarcely reaches some of the others. At first the current renders them more painful on pressure, but this passes off, and their sensitiveness is finally lessened. Presumably, therefore, it causes the serous exudation to disappear and the indurations to shrink, just as massage does. Froriep used almost exclusively the electro-magnetic current, which gradually removed the indurations in a majority of his cases, but he also employed vapour baths, dry heat, iodine ointment, and liniments as adjuvants. For pain in the soles of the feet he used galvano-puncture. In the treatment of stiff joints, Hoffmann recommends faradism and galvanism as superior to massage, but this is contrary to my own experience.

Injection of chromic acid.—This method is only possible where the nodule is sharply defined, and can be accurately penetrated by a hypodermic needle. Strands and diffuse thickenings cannot be so treated, as the needle passes through them, and the fluid only irritates the neighbouring tissues without doing any good. A 1 per cent. solution of chromic acid in water is used, and about 5 to 8 minims are injected. The procedure usually gives rise to some aching, and occasionally to pretty sharp pain, lasting for an hour or two. The previous injection of a 1 per cent. solution of cocaine hydrochloride lessens this, but extreme care must be taken that it is sterile.

The chromic acid causes the nodule to shrink, and often greatly relieves muscular or nerve pain. The nodule is not dispersed, however, and may give rise in the future to pain and aching. The injection can be repeated, if necessary, but the relief is often permanent, and occurs very rapidly. Care should be taken to inject deeply, and not throw the solution into the tissue immediately under the skin, as it may give rise there to pain and phlegmonous induration. The inflamed portion of fibrous tissue is so small that it is very easily missed, and if this occurs no relief is obtained. To obtain good results, the chromic acid must actually penetrate the inflamed tissue, and this is not always easy of accomplishment.

Drugs.—Where intestinal indigestion is present, and this is especially recognised in lumbago, a course of mild purging is advisable—2 or 3 grs. grey powder or blue pill, or compound rhubarb powder, in the evening, followed by a saline before breakfast. As regards specific remedies, it cannot be said that any are known which cause absorption of the fibrous indurations. In quite early cases I have seen potassium iodide give relief, and Graves speaks very highly of its value in lumbago as tested in his own case, but in regularly chronic cases any benefit is not very apparent. Fuller says it is of no value in muscular rheumatism, but in joint rheumatism has some effect, and is very valuable in periosteal cases. Iodine ointment I have used extensively, but I question if it ever reached most of the indurations, or does much good apart from the necessary rubbing in.

Salicyl compounds (salicylates of sodium, methyl, quinine, and aspirin, salicin, etc.) given internally lessen pain during the exacerbations, and often give great relief. Methyl salicylate, applied locally, is absorbed and relieves pain locally, and in distant parts also. Their action is not curative, however, as they cannot be expected to remove fibrous tissue. The same is true of phenacetin, phenazone, quinine, and all similar compounds. Alkalies, ammonium chloride (Fuller), colchicum, arsenic (Scudamore, Hoffmann), cod-liver oil, guaiacum, actaea racemosa, I have found useless, and "Chelsea pensioner" is ameliorative in some cases, probably only through its mild purgative effect.

Counter-irritants sometimes do good, but very often have no effect. Probably many of the indurations are outside the range of their action. Where the joints, tissues, or periosteum are affected superficially, blistering or painting with iodine liniments lessens pain, and causes more or less absorption of the swelling.

Spa treatment.—Recent cases, where the fibrous thickenings are in the early stage and still plastic, may be cured by a course of hydrotherapy, but inveterate cases only obtain temporary relief from their sufferings, which usually return in full force on the first exposure to wet and cold after their return home. The drinking, bathing, and mild general massage, suffice very efficiently to empty the bowel freely every morning, and to promote absorption of the serous exudation in the fibrous indurations. This is sufficient to cure quite recent cases, and usually gives complete relief for a time to the aching, stiffness, and pain of chronic cases, so that the patient feels much more happy and energetic. The indurations remain, however, and on the first provocation they swell and become tender and painful again. The regular purgation (obtained at Harrogate for instance by the action of the sulphur water), and the consequent improvement of intestinal digestion, do great good in certain cases, probably by preventing the absorption of irritating substances from the bowel. The indurated fibrous tissue can, however, only be removed by local and well-directed manipulations, and this is undoubtedly aided by previous hot baths (water, peat, vapour, etc.), as the parts are relaxed and rubbing is much less painful. A spa has this further advantage, that patients are content to give the necessary time for massage and electrical treatment, and have the accessory advantages of elaborate bathing appliances, and of drinking a mineral water. They can also get such exercises as may be thought necessary.

Hardening treatment.—Persons who suffer from chronic rheumatism are often excessively sensitive to cold and damp, and develop an exaggerated fear of draughts. They sit in overheated, unventilated rooms, and often overclothe themselves. They also avoid sharp exercise, owing to the prolonged aching and stiffness from which they suffer after it, and they are apt, if they have the opportunity, to indulge unduly in hot baths, as these temporarily relieve the aching by relaxing the tissues. All this tends to soften them, and makes them very liable to chills, and so to acquire more rheumatic thickenings. With the disappearance of the indurations under treatment, all this should be changed, and an active muscular life and hardening régime substituted, but in a commonsense way, and having regard to the patient's age and occupation. Balfour says in his previously mentioned treatise: "For if percussion and compression are beneficial in proportion only as they facilitate motion, it must be admitted that indulgence and rest are the very food of rheumatism."

Diet.—Dietetic treatment is of no special value. The broad rule is to avoid gastro-intestinal fermentation, and this is best accomplished by a simple, ordinary mixed diet, avoiding such substances as cause indigestion or flatulence in any particular individual. A heavy dinner with numerous wines often starts a prolonged attack, but this is due, not so much to the wines directly, as to the indigestion which they may have caused. Total abstainers and women suffer from chronic rheumatism equally with the ordinary imbiber. In the same way, sugar and flesh meat are often forbidden to chronic rheumatics, but these are hurtful merely in so far as they cause intestinal fermentation and indigestion, which they do only in a small proportion of people.

Climate.—During residence in a dry, stimulating climate, the indurations may entirely disappear, and the individual ceases to suffer from his rheumatic pains. A short sojourn gives relief, but not cure. Some absorption probably takes place, and this, combined with the freedom from continual exacerbations, seems ultimately to lead to their disappearance. On the other hand, a seaside climate and a damp atmosphere increase the symptoms, and favour the conditions which give rise to chronic rheumatism. They often keep the parts aching more or less constantly, so that the patient hardly knows any other existence.

Surgical treatment.—It was mentioned previously that certain nodules, after prolonged massage, still remain very hard and fibrous, and cannot be dispersed. If a nerve passes through one of these, or is pressed upon by it, this may give rise to severe pain or continual aching. In such a case the nodule can be removed surgically. The operation is not always an easy one, as the small masses of fibrous tissue may lie pretty deep, and are then difficult to find. Before operation is attempted, they should, as a rule, be well massaged, till they become hard and defined. When they lie in the subcutaneous tissue, or attached to the skin, their removal is a very simple matter, and if their position can be accurately fixed, there is also no great difficulty in excising them from the perimysium. Their removal gives complete relief from the symptoms. Such treatment is only possible for large and well-defined nodules, or where a particular one is causing extreme pain, as in most cases the thickenings are too numerous and widely spread to permit of any idea of surgical interference.

Prognosis.—Some cases, mostly in young people, gradually recover without any special treatment, but the usual tendency is to get worse, and for the indurated tissue to become more fibrous and more widely spread. In cases of ordinary severity, even when the indurations are fairly numerous and widely scattered, recovery is assured if the treatment be persevered in. It requires, however, considerable resolution and determination on the part of the patient, as relapses are common, and he is apt to get discouraged. Many patients tire of the treatment, and give it up as soon as a decided improvement has occurred, but freedom from pain and aching can be counted on only if the fibrous indurations have been quite dispersed. This often requires three to twelve mouths of practically continuous treatment, but encouragement to go on is derived from the fact that many of them disappear much earlier than others. Soft recent nodules can often be got rid of in ten days, or disappear spontaneously. In very severe cases, where there is great induration and the patient is very stiff and crippled, recovery is hopeless, but by stretching, massage, and manipulations, more freedom of movement may be obtained. When the subcutaneous tissue is much thickened and brawny, as occurs most frequently in the lumbar region, or sometimes in the neck or fascia lata, any very substantial or permanent improvement is rare. In the joints, if the fibrous tissue changes are extensive, or if the bones and cartilages have been affected by prolonged malposition or disuse, or if the muscles are greatly atrophied, the results of even prolonged treatment are disappointing. With single indurations after injury, sprains, etc., the prognosis is good. A continued exposure to unfavourable climatic or industrial conditions may lead to the formation of fresh fibrous inflammations, but these are generally dispersed in a very short time if treated at once.

Prophylaxis.—Persons subject to chronic rheumatism should avoid exposure to damp, and especially sitting in a draught in wet clothes. After acute rheumatism, if any painful or aching spots remain about the fibrous tissues of the joints, periosteum, or aponeuroses, these should be thoroughly massaged until they disappear. The same course should be followed after influenza, scarlatinal rheumatism, "muscular" chills, violent muscular exertion, and stiffness from any cause.

After dislocations, sprains, fractures, rupture of muscles, and similar injuries, local massage and faradism should be employed until the exudation has been completely absorbed. Properly devised passive and active movements are also of great value in such cases.

Chronic follicular pharyngitis and chronic or acute tonsillitis should always be thoroughly treated, as muscular rheumatism seems very often to be associated with infection of the pharynx and tonsils. Digestion, and especially intestinal digestion, should be attended to, and all excesses, such as large dinners with a mixture of wines, carefully avoided.

In a person who has once been cured, any return of the symptoms may be speedily overcome by a course of spa treatment, or a short course of massage. A yearly visit to a spa, or a long holiday, with plenty of outdoor exercise, is advisable, as it gets the digestion into good order and gives a feeling of fitness. When the gastro-intestinal tract is acting well, the pharynx is much less liable to infection. Regular outdoor exercise and indoor gymnastic exercises are of great value, for, as Balfour says, "indulgence and rest are the very food of rheumatism."

REFERENCES.

ANSTIE.—"Neuralgia and the Diseases that resemble it," London, 1871. BALFOUR.—"Observations with Cases illustrative of a New, Simple, and Expeditious Mode of Curing Rheumatism and Sprains," Edinburgh, 1816. BARLOW AND WARNER.—*Trans. Intern. Med. Cong.*, London, 1881, vol. iv. BERGMAN.—*Schmidt's Jahrb.*, Leipzig, 1875, Bd. clxvi. S. 165. BESNIER.—*Dict. encyc. d. sc. méd.*, 1876, Sér. 3, tome iv. p. 726. DURAND-FARDEL.—"Traité pratique des Maladies Chroniques," 1868, tome i. p. 355. DUCKWORTH.—*Trans. Clin. Soc.*, London, 1883, vol. xvi. EWER.—*Berl. Klinik*, 1892. FOWLER.—*Trans. Clin. Soc.*, London, 1884, vol. xvii. FRORIEP.—"On the Therapeutic Application of Electro-Magnetism in the Treatment of Rheumatic and Paralytic Affections," translated by R. M. Lawrence, M.D., London, 1850. FULLER.—"On Rheumatism, Rheumatic Gout, and Sciatica," 1882. GARROD.—"Treatise on Rheumatism," London, 1890. GRAVES. —"Clinical Lectures on Practice of Medicine," 1864. HOFFMAN.— "Lehrbuch der Constitutionskrankheiten," 1893. HACKENBRUCH.— *Beitr. z. klin. Chir.*, Tübingen, 1893, Bd. x. HAYGARTH.—"A Clinical History of the Nodosity of the Joints," Bath and London, 1805. HELLEDAY.—*Schmidt's Jahrb.*, Leipzig, 1876, Bd. clxxii. S. 129. HUTCHINSON.—*Arch. Surg.*, London, 1897, vol. viii. INMAN.—"On Myalgia," London, 1859. LEUBE.—*Deutsche med. Wchnschr.*, Leipzig, 1894, Bd. i. LONGSTRETH.—"Rheumatism, Gout, and some Allied Disorders," London, 1883. MACLAGAN.—"Twentieth Century Practice of Medicine," 1895, vol. ii. MAHOMED.—*Brit. Med. Journ.*, London, 1882, vol. ii. p. 827. MIDDLETON.—*Am. Journ. Med. Sc.*, Phila., 1887, vol. ii. p. 433. MITCHELL.—"Injuries of Nerves and their Consequences," 1872. NEWTON.—*Brit. Med. Journ.*, London, 1894, vol. ii. p. 651. PITT.—*Trans. Clin. Soc.*, London, 1894, vol. xxvii. SACHARJIN.— *Deutsche med. Wchnschr.*, Leipzig, 1894, S. 525. SCUDAMORE.—"A Treatise on the Nature and Cure of Rheumatism," London, 1827. STRAUSS.—*Berl. klin. Wchnschr.*, 1898, S. 89. VOGEL.—Virchow's "Specielle Pathologie u. Therapie," 1854, Bd. i. VIRCHOW.—*Virchow's Archiv*, 1852, Bd. iv. S. 270. VOLKMANN.—Pitha and Billroth, "Handbuch der allg. u. spec. Chir.," 1882, Bd. ii.

THE NEURAL FACTOR IN HEART DISEASE.[1]

By ALEXANDER MORISON, M.D., F.R.C.P., *Physician to Out-Patients at the Great Northern Central Hospital; Physician to the Children's Hospital, Paddington Green, London.*

IN my lectures here last year on "Cardiac Pain," I pleaded for a more systematic and routine examination of the cardiac nervous system, in cases dying of heart disease. Although, since Lancereaux's observations in 1865, others have investigated the condition of the nervous endowment of the heart from time to time, the research has not been systematic or frequent. Indeed, the point appears to have been less, rather than more, attended to as time has elapsed. This is probably to be accounted for by two reasons, namely, the tendency for clinical views to be influenced by the current doctrines of physiologists, which have frequently to be revised, like many other human conclusions, and the usual dissociation of the clinician and pathologist. Many circumstances render this unfortunate dissociation, as a rule, unavoidable. Hence the comparatively slow progress of medicine. To patiently seek after death the cause, when possible of discovery, of phenomena observed during life, is the surest road to enlightenment as to the nature, and, more important still, the treatment of disease. The search may often be fruitless, and life, in proportion to art, as short now as in the days of Hippocrates, but the mutually enlightening clues of bedside observation and post-mortem explanation must appeal with greatest force to the pathologist who is also the clinician. In such investigations, the first necessity is the establishment, in the mind of the seeker, of a normal standard for different ages, after which deviation from it may be detected. Such standards are provided by healthy persons who die suddenly from accident or self-destruction. That systematic research on these lines is not likely to be altogether fruitless, may be gathered from some of the sections which I have placed under the microscope and on the screen for your inspection. But whether we can find in fatal cases, on investigation, sufficient evidence of the rôle played by the cardiac nervous system in the phenomena observed at the bedside or no, the history and character of clinical disturbances frequently argues the predominant (not necessarily sole) participation of the regulative nervous apparatus of the heart in the production of these. The following case, the diagnosis of which lies between death from acute myocarditis alone, and a fatal issue due to the heart having raced itself to death by an explosive tachycardia, occurring during convalescence from that disorder, and probably provoked by it, will point my meaning.

---

[1] A lecture delivered at the Polyclinic in London, on 30th April 1903.

Case 1.—Florence M., æt. 7, was admitted into the Great Northern Central Hospital, under the care of my colleague, Dr. Clifford Beale, on the 8th of August 1902, with slight fever, associated with a mitral regurgitant lesion. The patient had suffered from rheumatic fever two years previously. She was discharged convalescent on the 20th of the same month. She then attended as an out-patient under my care. Her progress was satisfactory, until she presented herself on the 26th of September following, when she had well-marked tachycardia, the pulse being uncountable at the wrist, and the heart-rate very high—at least 200 in the minute. The child was at once admitted to hospital under my care. The attack of tachycardia, which was associated with very little fever or respiratory distress, lasted for a week. The heart sounds were distinct, the systolic bruit loud, and the area of cardiac dulness much extended. The urine was free from albumin. On the 2nd of October, the pulse-rate fell from 200 to 100 in the minute, and thereafter varied from 98 to 108, until the 12th of October, when it rose to 160, and is stated to have fallen in the evening to 100; the child died the same night. The liver was enlarged, and the urine had contained albumin for some days prior to death. On the 8th of October, there was œdema of the face and of the feet, and that in the former position became more pronounced than in the lower extremities. Impaired resonance was also now detectable in the right interscapular region, and a drowsiness which had begun to manifest itself became more marked, but without any evidence of abnormal loss of power in the limbs. That is, there were no signs of paralysis from embolism or other cause. On the 11th, the child was evidently sinking, and died, as I have stated, during the night of the 12th. The post-mortem examination was made on the 14th of October by myself. There was no trace of recent inflammation of the endocardium, or of the pericardium, to the naked eye, although the latter contained 3 oz. of clear serous fluid. There were no pericardial adhesions. The left ventricle was hypertrophied, but not markedly, if at all, dilated, and contained little blood. The anterior cusp of the mitral valve was thickened, and the auriculo-ventricular orifice admitted three fingers conewise, that is, two passed from below and one from above. The left auricle was much dilated and firmly packed with dark clot. The aorta and the aortic valves, together with the coronary arteries, were normal. The right ventricle was dilated, and filled with clot, part of which was decolorised. The pulmonary valves were normal, as also was the tricuspid. The tricuspid orifice, like the mitral, admitted three fingers conewise. The right auricle was much dilated, and filled with blood-clot. The myocardium on section was apparently normal. On microscopic examination, the transverse striæ of the muscular fibres were less visible in some sections than in others, stained by another method, but, on the whole, there was no condition of muscle which could be positively asserted to be pathological. There was, however, distinct evidence in some sections of active interstitial hyperplasia, and of this in immediate relation to the trunks of cardiac nerves in the neighbourhood of the right coronary artery. The cells of the left inferior cervical ganglion, which was examined as one of the motor outposts of cardiac innervation, showed little if any pathological change. The only possible difference between these, and cells from a normal ganglion, was that they appeared in greater numbers to be pigmented than in normal circumstances. There was no marked hyperæmia of the ganglion. As regards the clinical phenomena of the case, a glance at the chart of the pulse, respiration, and temperature of this patient, taken during the two periods of her residence in hospital, shows the remarkable disparity between the pulse-rate and the respiration and temperature during her fatal illness.

It may, I think, be justly argued, in view of all the circumstances mentioned, that the escape of the heart from nerve control in this case was due rather to failure in this part of the mechanism provoked by interstitial myocarditis, rather than to the latter condition and the state of the muscle only. The result was an adynamic distension of all the cavities *behind* the left ventricle (and the fact is very important), which very forcibly suggested a paretic distension of the three after-coming chambers, analogous to that seen in the bladder in cases of retention of urine. There was, in short, a retention of blood caused by the tachycardial but undilated left ventricle. The case, moreover, presented the fully expressed clinical signs of an essential tachycardia in the sudden and sustained high rate of the heart, the great dilatation of the organ, the sudden drop to a comparatively normal rate, and in the absence of marked respiratory distress during the period of cardiac acceleration. When these signs occur in an otherwise healthy heart, we know that the organ frequently recovers its normal rate and tone with surprising rapidity. And, indeed, sometimes even when chronic valvular disease is present. But tachycardia supervening upon valvular defect may destroy a perfect compensation of long duration, and may do so with a suddenness suggestive of valvular rupture.

Case 2.—In 1896, an intelligent, but neurotic man, æt. 29, a carpenter by trade, came under my care at the St. Marylebone General Dispensary with very irregular and rapid action of the heart in association with a mitral lesion. The account he gave of himself was that eight years previously, being then, so far as he knew, in good health, and certainly unaware of having heart disease, he was returning home at the close of his day's work, when he observed the curtains of a house on fire. He ran up the doorsteps, violently rung or knocked at the door for admission, and rushed past the servant who answered his summons into the ignited room. The family were at dinner elsewhere, and the household was unaware that their premises were ablaze. My patient extinguished the fire by beating it down with his overcoat. The master of the house appeared in due course, and rewarded the amateur fireman with thanks and a sovereign, which the latter considered an ample recompense. The palpitation of his heart, induced by this experience, did not, however, subside, and he was confined to his house, or out of work for eight months afterwards. The diagnosis of a ruptured valve was made by those in attendance upon him. From time to time thereafter, his heart troubled him. The attack of cardiac failure, for which he consulted me, was severe, and lasted for some time, but subsided under treatment. I advised him to abandon his proper calling, and he opened a small newspaper shop, married, and had a family. Although he had occasional attacks of cardiac failure of great severity, he survived these, and finally left London to take care of a house in the country. There he had another attack, in which he died. The family informed me of his death, and consented to a post-mortem examination, which I made in company with two friends. Although no history of rheumatic fever could ever be elicited in this case, an attack of chorea in childhood was admitted, and on examination we found a well-marked mitral constriction, but no evidence of recent or remote rupture of a valve or its attachments.

The history of this case reveals the predominant influence of the nervous factor in undoing a well-established cardiac compensation. But it may be argued that the violent exertions of this patient, fatigued no doubt by his day's work, may have disabled the muscular rather than the nervous factor in cardiac action, and that, to some extent, this may have been so, I am not concerned to deny. Cases, however, occur in which the preponderant influence of the muscular factor may be altogether excluded. I recently saw, in consultation with Dr. Lewis of Hamilton Terrace, a lady, æt. 53, who had been a cardiac cripple for nine years, and whose symptoms had arisen suddenly under tragical circumstances. She had suffered from rheumatic fever when a girl, æt. 16, but the fact of her having heart disease, if known at the time, had been quite forgotten in her subsequent good health. She had married, and borne children without accident, and led an otherwise normal life in comfortable circumstances. Nine years ago one of her children was convalescent from infectious disease. She was in the act of preparing a disinfectant bath, and had poured the disinfectant into the tub. She turned her back to procure the water for diluting it. At that moment the child sprang into a layer of carbolic acid, and sustained such injury as to die in consequence. The shock to the mother was so great as to disorder her heart, which on examination revealed valvular disease. The cardiac failure has since then been progressive.

These instances, which might be multiplied, will serve to show that, whatever independence the rhythmical action of the heart may possess, in the human being, at all events, the nervous factor in cardiac action is, if not of the first, certainly of very great importance, both for the explanation and treatment of cardiac failure.

While I have thus shown that the mind may affect the action of the heart, it is no less true that that organ may be disturbed by reflexes originating peripherally, and by states of general exhaustion following sudden or great explosions of nervous energy. As I had occasion last year to deal more in detail with some of these in my lectures on "Cardiac Pain," I shall not now consider the point, even with the fulness our present meagre knowledge would permit. It may be pointed out, however, that the fatal tachycardia which overtook the child whose case I have already described was, in all probability, caused by a reflex originating in the peripheral nerves of the heart, and due to the stimulation of an interstitial myocarditis. Through this agency, a nervous instability probably inherent in a neurotic child, rendered still more sensitive by the debilitating influence of a rheumatic attack, was cast into a state of absolute loss of nervous control, and found expression in a well-marked tachycardia, which was out of proportion to that usually observed under these circumstances. That, at all events, is the explanation which appears to me to be most in accordance with the clinical and pathological facts of this case. I asked my friend and clinical assistant, Dr. Knox of Highgate, who is competent for the task, to examine sections of the heart bacteriologically, and he informs me that his search was negative. Whether the tachycardia in such a case, arising on the hypothesis advanced, is more nearly due to a disablement of the pneumogastric nerve directly, or to an overpowering of its inhibitory action by excessive stimulation of the accelerant nerves in the first instance, is a detail concerning which nothing positive can at present be asserted. Possibly both these factors, and a *tertiam quid*, may be involved, but in the meantime we must wait for our facts rather than project possibilities.

Treatment.—In considering the lines of treatment indicated by disturbances assumed or found to arise in the sphere of the neural factor in heart disease, we have necessarily to bear in mind the ostensible particular cause in each case. This is not always easy to determine. The effect obtrudes itself upon the physician and distresses the patient, but the cause is not always on the surface of things. It may reveal itself later, or it may not. The lesson to be drawn from the fatal case of myocarditic tachycardia, related as occurring in a child, is an important one. While regarding the case as predominantly one of neural disorder in the first instance, it cannot be denied that a long quarantine is desirable in the case of young children before they are allowed to escape skilled observation. The danger is rather from disturbed effects than from the recrudescence of an original cause. This fact was well brought out in that masterpiece of clinical observation and thought in small compass,[1] by the late Dr. Octavius Sturges. But any history of even mild fever with cardiac acceleration in a rheumatic subject, and especially if associated with an organic lesion, should place the physician on his guard.

For the control of a runaway heart two agencies have a paramount utility, whatever other adjuvant measures may be taken, namely, the local application of ice to the head or præcordia, and the use of opium. Some years ago I met a friend in consultation over a case of tachycardia of some days' duration in a man of middle age, who had mitral regurgitation from valvular disease of long standing. We prescribed a moderate dose of tincture of opium (12 or 14 minims) to be taken at bedtime. On seeing my friend again some time afterwards, I inquired for this patient. He informed me that he had very rapidly been relieved from his symptom, but that he did not consider that my advice had been of so much service as the action of the nurse! Instead of giving the patient a single dose of the opiate, of which six were contained in the bottle, she had, in ignorance, and with a fine contempt for consequences, administered them all at once. The patient slept heavily for nearly twenty-four hours, and awoke quite free from his distressing tachycardia. We need not imitate the boldness of this nurse, who might have found herself in the pillory, had a fatal issue ensued, but such a case exemplifies very well the frequently observed beneficent effects of a sufficient opiate in such cases. Some time after this attack, I was informed that this patient painlessly passed a gall-stone, but as he had no symptoms prior to or during his tachycardia pointing to its existence, the fact, though interesting, is probably unconnected with the cardiac condition.

---

[1] "Heart Inflammation in Children."

The effects of mental emotion are in some degrees related to the nature of the disturbing emotion, although, like most problems in mind, it is difficult to detach completely one element in a chain of thought or feeling from others. There is usually, however, in a sustained state of mind a dominant note, and that note runs through the harmony or discord of the succeeding tune—that factor or cause influences in a characteristic manner the effects originated by it. The young workman who extinguished a fire and whose case I have mentioned, returning at the end of his day's work, ignorant of latent heart disease, had the healthy accelerated cardiac movement of a rescuing excitement, in which his own feelings were not deeply engaged. His pacing heart outran itself, and for months he lay disabled for work. But although the anxiety of such a situation probably prolonged his period of cardiac failure, he belonged to an honest, hard-working, and mutually helpful family, had youth on his side, and had none but a more or less pleasant recollection of his amateur firemanship. He recovered, as I have stated, in about eight months, and continued at work thereafter for about five years before his next serious breakdown. The character of his heart's action during the periods of failure when I observed him was an arhythmical tachycardia, which settled into slower action as he improved, but never became absolutely rhythmical. He responded well to treatment by ice, rest, and digitalis.

If we compare with these circumstances in this case, the causal elements and their effects in the case of the mother prostrated by the accidental death of her child, with which, however unjustly, she might in a measure have taxed herself, we find persistent causes of depression and disturbed emotion which were absent in the case of the man. In her case, there was no such interval of complete recuperation. She was certainly older than the man, but she had no necessity to work, was in generally comfortable surroundings, and had every care taken of her. She had visited Nauheim, but without benefit. Those who "cross the sea" and "change their skies" but carry with them "the memory of a rooted sorrow," cannot "cleanse the stuffed bosom of that perilous stuff which weighs upon the heart," by visiting a health resort. The "sweet oblivious antidote," be it philosophic resignation or any other equally tranquilising mood, which is the prime necessity for a restoration of easy cardiac action, cannot be supplied from without. And though the patient "minister to himself" or herself in such case, as best he or she may, the result of such ministration must depend on many circumstances moral and physical, which are difficult to control. A heart under these circumstances may "break," however whole at first, and if, as in this case, it be already cracked and the sufferer a sensitive woman and a fond mother, the incidence of such a cause as that existing in this case might be expected to be severe, as indeed it proved. Digitalis in this case, Dr. Lewis informed me, was detrimental, not useful (the lesion was mitral obstruction), and the chief benefit was secured by the nitrites—the accelerant action of which, and consequent freer peripheral circulation, might be likened to a ghastly imitation of the physiology of joy. I have no desire to dwell at too great a length on the psychical side of this question, or to emphasise the impotence of medicine to deal with "minds" thus "diseased." It is a relief to turn to the tangible evidences of physical disturbance in the regulative centres of the heart, regarded as a more or less damaged pump, however imperfect our present knowledge of these conditions. One of the sections I prepared represents the left inferior cervical ganglion of a woman, æt. 27, who died in the Great Northern Central Hospital from aortic regurgitation, and some recent valvulitis of the mitral cusps, in whom the pericardium was universally adherent, and whose heart weighed 30 oz. The cardiac overwork was therefore of some duration. In her the ganglion showed much chronic venous congestion, and although apparently healthy cells are to be seen in it in great numbers, there is an altogether disproportionate number of pigmented and perhaps degenerated cells. There can naturally be no question of a cure of such a state, the condition of cardiac overwork is in its nature permanent, and the only possible termination of such a case is death. To compare with this specimen, I also prepared sections from the same structure—(1) In a healthy young man, æt. 19, who died of appendicitis and whose heart was healthy; and (2) in a man whose age was calculated to be about 50, who had atheroma of the aorta and sclerosis of the aortic valves, and who committed suicide by prussic acid. In the former, the ganglion was apparently congested, but although the vessels are numerous they are neither dilated nor tortuous as in the cardiac case, and although some pigmented cells may be seen, they are few and far between. In the latter, the general vascularity is much less than in the cardiac case, but the pigmentation much more. The pigmentation gives much the same refraction to light as blood cells in the vessels, and, as we know, the value of pigmentation, as to its pathological or physiological character, is still a moot point. There appears also to be a certain amount of interstitial cellulitis in this case, which was quite possibly of a specific character, as it is stated in the notes of the necropsy that there was "one single large patch of atheroma on the posterior surface of the lower half of the ascending part of the arch." The heart is stated not to have been enlarged, and the coronary arteries were healthy. The kidneys were "somewhat granular," and the other organs normal, including the brain. The stomach was full of food, and the body well nourished. The lesson taught by the conditions in the cardiac case, of which the neural element was but one and subsidiary, is not the indication of exercises, however gentle, but of complete physical rest, and the securing of circulatory relief by a careful regulation of the blood pressure by graduated feeding, if necessary by blood letting, and the employment of the belladonna or digitalis group of cardiac tonics as experience may indicate in particular instances and on particular occasions in any such given case and in sufficient doses. Whatever be the ostensible cause of the cardiac overwork, whether fever, emotion, or mechanical impediment, it must be treated *secundum artem*, and with a view to the moderation or removal of the predominantly disturbing cause.

I am aware that these remarks but touch the fringe of a wide subject, to deal with which adequately in one lecture is not possible. But so far as the management of the neural factor is concerned, while we may admit its importance, we have yet much to learn even of its nature, and I offer the facts I have related as a trifling contribution towards the better knowledge of a subject, in my view, of much importance, but which has hitherto been almost purposely ignored, so little has its pathology been investigated. By searching systematically on the lines indicated, however, up to the sources of cardiac nervous regulation, we shall certainly know more than we do at present, and as "knowledge" is often "power," let us hope that we shall be able to do more than we frequently can do now. Above all, let us avoid losing ourselves in clouds of hypothesis or in the blinding mists of prejudice when knowledge is obscure, and patiently seek the only thing of value in every sphere of thought, namely, a tangible, indubitable fact, which will in due time be its own best interpreter, and, once correctly explained, the surest guide in treatment.

THE RELATIONS OF THE INSANITIES TO CRIMINAL RESPONSIBILITY AND CIVIL CAPACITY.

By SIR JOHN BATTY TUKE, M.D., F.R.C.P. Ed.; and
CHARLES R. A. HOWDEN, M.A., *Advocate.*

(*Continued from page* 154.)

III. THE PSYCHOLOGY OF INSANE ACTION.

MERE proof of the existence of insanity in a given case is only a necessary preliminary to further investigation. Insanity does not in the eye of the law destroy the conditions of responsibility and capacity. The principle laid down by the judges in their answers to the questions submitted to them by the House of Lords, in connection with Macnaghten's case in 1843, still holds good. In reply to question 4, to what extent the presence of delusion should excuse the commission of crime, the answer in effect was that there must be some direct relation between the delusion and the criminal act. The same answer accepted as a fact the existence of partial insanity. It therefore becomes necessary, not only to prove insanity, but also to discover to what extent and in what manner it has affected the mind.

Further, when we come to deal with the separate relations of insanity to responsibility and capacity, it will be shown that the standard—so to speak—differs materially in each.

We must understand clearly the difficulty of the analysis which is thus required. Even in the case of sane men it is no easy matter to ascertain with any certainty the motives which led to a particular act, and to appreciate the strength or weakness of their power of resistance to impulse; but in their case we are guided by our own conscious experience, and if sufficiently informed, can imagine the mental condition which preceded the act. Our ordinary mental experience, however, does not avail us in the same way in the case of insanity, for in it we have to deal with elements which are entirely strange to us, and with disordered mental functions which are quite foreign to our experience. The ordinary processes of thought are modified or altered; external impressions and past experience do not produce their ordinary results; ideas, feelings, and emotions do not spring from their normal antecedents, but directly from diseased bodily conditions. We may guess at the nature of these mental states by their external manifestations, but we can do little more than guess, for all our ordinary means of judgment are rendered uncertain by the morbid change.

We have therefore the greatest difficulty in understanding the working of an insane mind, even when we have all the information we could possibly expect. We may indeed, by observation and experience, form tolerably accurate notions of its capacity and of what might be expected from it, but we can never really reconstruct it in our imagination, and are therefore always on unsafe ground; indeed, we very often do not possess sufficient information even for the limited conclusions we are entitled to form.

In many forms of insanity, and especially in their initial stages, the signs of serious mental disorder are either suppressed, or pass unobserved, or are misconstrued. In every case where the morbid process is either progressive or irregular, the symptoms change, and we may have only a short experience to guide us. Very often the act with which we are concerned was committed during one of those short crises of intensity to which most nervous diseases are subject. In many such instances our experience of the individual case does not carry us very far. We require a considerable period of observation in order to estimate, even approximately, the manner and extent to which the mind is affected, and we can only obtain an opportunity for this when the mental disorder has continued for some time unchanged.

To some slight extent we may be assisted in conceiving the nature of the phenomena of insanity by certain temporary conditions of the sane mind. The phenomena of dreams and somnambulism appear to resemble closely some of the insane conditions. Numerous illustrations are also afforded by the victims of alcohol and of certain drugs, in whom the mind is acting for the time under abnormal stimulus or depression. We may the more readily draw illustrations from the temporary insanity of alcoholism, because we know that in it the mental phenomena are produced by change in the physical conditions of the brain, with the nature of which we are acquainted.

Generally, however, when we attempt to reconstruct for ourselves the mental conditions from which some insane act has sprung, we naturally have recourse to analogies which fall within the range of our ordinary experience, and especially to those states of mental excitement and confusion, of violent passion and emotion, which seem to present the nearest resemblance to the phenomena of insanity. Within certain limits we are perfectly justified in thus making use of the ordinary analysis of psychology, for the mental functions are not completely changed by disease. The insane no more possess different functions from the sane than they speak in a different language. Their feelings are the same in kind as those of a sane man, and lead naturally to the same results in action. Their intellectual processes, so far as they go, are carried on by the same steps, and break down at the same points at which sane men are liable to fall into confusion and error. If their faculties are defective, the defects, taken by themselves, closely resemble those which we observe in the lower stages of development. The whole intellectual machinery often appears to be quite intact, and, at the most, to be directed to some unusual end or purpose. It is not, therefore, surprising that, except in extreme cases, the isolated acts of the insane frequently resemble closely the actions of sane life; their immediate motives often appear to be precisely similar, and their purposes are frequently carried out by the same means which we could conceive to be employed in like circumstances by sane men. In such cases people are often tempted to imagine that they have to deal with nothing more than extreme instances of the same kind as they meet with in ordinary life, and it was on this supposition that insanity was often dealt with in the older cases. The judges, seeing that the mental functions were apparently unchanged, and not being able to go below the surface of the case, often held that, whether it was insanity or not, it did not differ essentially from cases of ordinary crime.

Although the mental functions thus remain so far unchanged by insanity, that we often find them working for a time in apparent accordance with their natural laws, and can still trace their partial and interrupted operation, even when the mind is broken up or radically defective, their correspondence with the functions of the sane mind and its disturbances is nevertheless limited in such a way that we cannot make use of our ordinary experience except with the greatest caution. The functions are not merely excited or weakened by disease, but are affected irregularly, so that one may be abnormally stimulated while another is weakened or almost suppressed. The errors and defects of the intellectual processes, although often resembling those into which a sane man might conceivably fall from some temporary cause, result from disease, and are therefore not only incapable of being corrected by consideration of the consequences, but are liable to increase in intensity. Mental states are produced not by their natural antecedents, but by morbid conditions, or by some stimulus which would be wholly insufficient in health, just as in other parts of the nervous system pain is directly produced continuously or intermittently by disease, or by some cause which would have had no perceptible effect in a healthy state. Thus, insane feeling and emotion are manifested without any apparent cause, or as consequences of one which seems wholly inadequate; ideas arise in the mind which have no natural connection with external circumstances or previous experience, and often appear in strange combination, as in dreams. These morbid states are distinguished by their intensity and persistence; for they depend on the existence of disease, and while they are always relatively more powerful than other states of the sane mind which do not appear to spring from a morbid element, they sometimes rise to a pitch of intensity which cannot be paralleled in any sane state. By the deflections and new starting points introduced by these morbid sources, mental action becomes broken and discontinuous; its different states are no longer co-ordinated or bear the same relation to each other; it acts out of harmony with external circumstances, and in judging of it we are no longer guided to its motives by the influence which these would have exerted upon sane men.

Although, therefore, when we are endeavouring to analyse insane mental conditions, we must necessarily start from our own conscious experience, and although we may sometimes find that by this alone we can trace the operations of a disordered mind more readily than we could expect, we must beware of supposing that we can ever obtain that approximately exact imaginative knowledge, in virtue of which we pass judgment upon the acts of sane men. It is very difficult to represent to ourselves, with any degree of accuracy, even the results of mere defect or incapacity. We cannot completely enter into the workings of a mind which is on a distinctly lower level than our own, and it becomes impossible when, in combination with defects, we have to deal with disorders and mental states which are produced by disease, and which, though in their nature not strictly foreign to us, differ from those with which we are familiar, in their intensity and persistence, and in their relation to other mental states. In every case of insanity we encounter something which is, strictly speaking, unintelligible to us, and the nearer it approaches apparent intelligibility the more likely are we to be misled.

Even the general outlines of the psychology of the insane are still very obscure. The connection between morbid mental states and underlying physical conditions is to a great extent matter of surmise, and the deviations from the normal conditions are so various and complicated, that they scarcely admit of a common description. We must, however, notice in a general way some of the most prominent and important features which we encounter in insanity, and before doing so, it will be well to recall the general nature and object of the inquiry which the law requires.

In every case we have to inquire into the state of mind out of which acts spring. We have to see how far the conditions, which are the result of disease, have destroyed the power to form a correct judgment of the consequences of our acts, and to give effect in action to the judgment which we have formed. These are the essential elements of that *libertas arbitrii* with regard to our actions, which is the primary assumption of all theories of legal responsibility and capacity. In using, however, such a word as freedom, we must at the outset guard against the possibility of being entangled in metaphysical theories. A practical system of law has no concern with metaphysics. It must start from assumptions, which are based upon common experience, and which are understood and admitted by every one. The region of law terminates at the point where metaphysics takes up the discussion of the nature and origin of these assumptions. When, therefore, we use such words as free choice or self-determination or self-control, we use them without reference to their metaphysical import, as merely expressing facts of mental experience, the practical meaning of which is known to all. Every one knows well enough what is meant when we say that our choice is limited by our knowledge, or that our self-control is diminished by a fit of passion. Phrases like these never lead us into any difficulty when we apply them to the ordinary facts of life, and it would scarcely be necessary to refer to them were it not that in cases of insanity we find them used in such a way as to create quite unnecessary confusion. Judges have repeatedly asked, whether an impulse was irresistible or simply not resisted, unconscious apparently that they were putting the question in a form which directly suggested the metaphysical difficulty, and which, of course, was equally insoluble whether the case was one of insanity or not. If we use words like these, we must keep them clear of any absolute or metaphysical state. In judging the insane, we necessarily make use of precisely the same general ideas of the way in which our actions are determined as those which guide our judgment in ordinary life. We habitually recognise the existence of a mental freedom which is never perfect, and which depends on a variety of mental, and even of physical, conditions. It is on the assumption of a normal minimum amount of this freedom that the law bases its conception of responsibility and capacity, and the problem we encounter in dealing with insanity is to determine in what way the conditions on which it depends are affected by the influence of disease.

The old view of the law, which, though greatly modified in practice, continues in theory to the present day, took no account of insanity, except in so far as it affected knowledge of the difference between right and wrong. If the reasons which ought to restrain a man from committing an act lay within reach of his intelligence, it did not inquire whether he was sufficiently capable of deliberation to give them their natural weight; nor did it admit the possibility that freedom of action might be destroyed by any motive however powerful. Partly, as we have seen, the limitation was due, on the side of theory, to the direct application to law of the terms and ideas of a metaphysical theory which admitted of no degrees, and which necessarily excluded everything but the question of knowledge from consideration. To a still greater extent perhaps it arose simply from ignorance of the phenomena of insanity. At the time the definition of responsibility was formulated, men did not recognise how deeply insanity affected the power of determining actions in other ways than by merely limiting or falsifying knowledge.

In ordinary sane life no mental fact can be more commonplace than that the extent of our knowledge is not the only condition which limits or affects the free choice of our actions. We lie at the mercy of the nearest or most immediately powerful motive, unless we are able to suspend our action until we have summed up its consequences, until we can see in what way it will affect ourselves and others after the momentary impulse is past, and how far it is in accordance with other ideas and feelings which are temporarily in the background. To a large extent this power of restraint depends upon the readiness with which ideas and feelings opposed to the immediate impulse occur to us; but we are also conscious of a distinct exertion of volition, by aid of which we repress the immediate impulse to action, and call up the remoter consequences into greater clearness.

Men differ immensely in their power of deliberation and self-control, and not less in the force of the impulses by which they are affected. One man can scarcely be stirred to passion or emotion, while others seem to be carried away as if by an overpowering force. Some persons are so excitable, that, under the influence of ideas or feelings which take hold of them, the ordinary power of deliberation is almost entirely suspended, and they become totally incapable of paying steady attention to anything which comes into conflict with the dominant current. Men of excitable imaginative temperament become so possessed by some scheme or idea, that whatever judgment or deliberation they have seems to be wholly enlisted in its service. In other instances we find them brooding over ideas, suggested by feelings like suspicion or jealousy, until these feelings have obtained complete mastery over them, and at some points become not unlike the delusions of insanity. In our moral judgments we habitually make allowance for these differences when they arise from natural temperament or from the abnormal pressure of external circumstances, although we are often checked by the consideration that the weakness has been caused or fostered by previous conduct; and even in law they are occasionally taken into account in determining the amount of punishment. In ordinary circumstances we cannot permit these differences to affect the question of responsibility, partly for various reasons of expediency, but still more because we cannot believe that in sane life they ever go so far as to abrogate entirely the foundations upon which responsibility rests.

When, however, we come to deal with insanity, we find that the power of deliberation and self-control sinks far below the lowest point to which it falls in sane life, and that from causes which are entirely beyond the sphere of will. An insane man may be capable of understanding that an act is morally wrong, or forbidden by law, or contrary to his own interests, and yet he may be quite unable to restrain himself from committing it. There may be reasons for not committing an act, which lie quite within the sphere of his intelligence, and which would have been sufficient to have restrained him had he been sane; but he may be quite incapable of making the effort necessary to bring them clearly before his mind, or of controlling the force urging him to action. Although, therefore, we find on examination that an insane person appears to understand quite well the nature and consequences of an act, it does not in the least follow (even supposing the knowledge to be real, and not mere verbal recollection) that at the time of its commission he was able to give effect to these considerations in the same way that a sane man would. Very often it seems certain that these restraining influences were either wholly absent from consciousness at the time they were required, or that they were only dimly present, and that the mind lacked the power necessary to stay its action and to bring opposing forces to bear upon it.

In less extreme stages of excitement, in which the disorder has not reached the length of entire incoherence of ideas, the prominent intellectual symptoms often consist solely in the rapid succession of ideas, suggested either by external circumstances or accidental association, and the tendency to give immediate expression to them either in speech or action. Any one who has to deal with these cases sees clearly that the voluntary power of attention and control is to all intents lost. They may give clear and even brilliant expression to the ideas that occur to them, showing that in one way their intellectual faculties are not destroyed, but they cannot arrest the course of their thoughts or control their actions; the mind seems wholly occupied with the ideas which are immediately present to it, and cannot bring them into their natural relation to those which lie in the background. Sometimes we find the power of control quite as much lost as in maniacal cases, without the patent marks of excitement by which these are distinguished. There are cases which present a singular resemblance to somnambulism, in which the mind seems governed by a confused succession of thoughts, apparently quite independent of voluntary control, and which often supply motives to action of which it is only partly conscious.

In some of these cases it would almost appear as if the loss of control were the chief mental symptom of disease; but in the vast majority of cases, we have obviously to deal with a complex of mental conditions, which we cannot clearly distinguish in the result. In the maniacal cases, the diminution or disappearance of the voluntary controlling power is closely associated with persistent general excitement. In other instances, where the excitement is not so continuous or general, we find that every stimulus which affects the mind at all deeply produces an effect which is abnormal either in its intensity or duration. It may produce a violent explosion of passion and action, out of all apparent proportion to the normal effect of the antecedents; or, in some instances, when the effect is not so immediate and apparent, it may continue long after it would have passed away in a healthy state, and may persist until it is relieved by action, or swept away by the advent of some stronger influence. In many cases we find conditions like these in combination with general intellectual weakness and confusion, so that the mind is not only incapable of realising fully the nature and consequences of its actions, but is peculiarly liable to be driven into action by any strong motive which lies clearly within its apprehension.

The cases, however, in which the inadequate power of deliberation and resistance are most conspicuous are those in which the impulse to action is derived from one of those positive states of feeling or thought which are peculiar to insanity. The insane motive is sometimes so prominent and powerful, that we should be inclined to think its influence irresistible, even if we could imagine it to be opposed by a mind that was otherwise wholly unaffected; but such a case is scarcely conceivable. The general result of experience compels us to assume that, in dealing with an insane motive, we have to take into account, not merely the influence which it exercises directly and indirectly upon action by virtue of its intrinsic force, but also the fact that it has sprung from morbid conditions, which have to a greater or less degree affected the mind generally.

In the popular view, insanity is chiefly associated with delusions and other marks of great intellectual disturbance. In point of fact, the phenomena of insane feeling are at least equally important. In the great majority of cases the change of feeling is the earliest indication of insanity, and in many instances continues to be the principal symptom, although attended or followed by marks of intellectual disorder.

Sometimes we find that the capacity for feeling or emotion has diminished, or almost wholly disappeared. Many of the congenital cases and the chronic forms which succeed acute stages of disease are distinguished by general apathy, or by inaccessibility to all but the lower forms of feeling and emotion. This apathetic indifference to the higher feelings often forms an important element in the conditions which sometimes pass under the name of moral insanity, and in all forms of mental disease we frequently see it glaringly exhibited in affections; as for instance in the entire indifference which succeeds the commission of a crime.

The most important changes of feeling are not merely negative in their character, but consist in phases of mental excitement, which operate in many complicated forms as a direct motive to action, and at the same time exclude and extinguish every mental state which cannot be brought into harmony with them. These conditions of excitement of feeling may take the direction either of exaltation or depression. In the former, they may appear as part of the general excitement, restlessness, and tendency to action, which characterise the cases passing under the name of mania; or they may assume the special forms of self-importance and vanity which are typically illustrated in the case of general paralysis. In whatever form they appear, they may be sharply distinguished from the natural states of joyous excitement; they are wholly independent of external circumstances; they do not spring from the antecedents which would give rise to similar conditions in a state of health, and they are quite unaffected by adverse influences. They entirely exclude feelings of an opposite character, and the subject of them is not touched in the least by the misfortunes either of himself or others; he is entirely occupied by the personal sense of exaltation and excitement, and with the ideas which are in relation to it, and views everything else with indifference.

The states of depression which occur with great frequency, especially as initial stages of insanity, are of greater legal interest and importance than those of exaltation. The latter appear more on the surface, and generally present unmistakable marks of mental disorder, so that they rarely pass unobserved or are misunderstood. In the states of depression, on the other hand, the symptoms are often much less striking, and the morbid nature of the condition may readily be overlooked until attention is called to it by some overt act. The tendency in these cases is rather to concealment than to disclosure; the ordinary duties of life may be discharged in a mechanical way, while the mind is all the while possessed by insane feelings and ideas which may at any time burst into action. For this reason these cases are exceedingly dangerous, as we are never sure that we may not be underrating the strength of the morbid feeling and the ideas associated with it; the content of the delusions is so shifting that we never can tell what direction they may take, or to what point they may attach themselves. This is especially true when they assume the form of suspicion, jealousy, or persecution.

The operation of these morbid states of depression is liable to be confused with the natural result of outward circumstances. Cases of this kind are frequently found in our criminal records. A man living under unfavourable conditions, and perhaps affected also by some special cause of depression, falls into a state of melancholy. He continues his work, and shows no sign of what is ordinarily recognised as insanity, until one day he murders his wife or children and attempts to commit suicide, alleging as a reason the state of misery which he sees to be impending. That is very often the whole outcome of the evidence in such a case, and the jury, receiving it in the light of ordinary experience, sees nothing in it to avoid responsibility. The motive is apparent and at least intelligible, and the feeling which led to the act seems to have arisen from actual circumstances. In a case of this kind, if it be really one of insanity, the apparently natural connection of the act with its antecedents may be entirely misleading. It may be assumed that because the state of feeling seems to spring from natural causes it must be itself natural though extreme, and the fact may be overlooked that, with the advent of insanity, it entered upon a phase that was wholly different. We find many instances of this delusive connection of the insane conditions with external circumstances, or with the previous mental life. Conditions of religious excitement pass into so-called religious melancholy; external troubles determine the nature of the subsequent dominant ideas; beliefs, which are really delusions, may seem to be based with some show of reason upon actual facts. In all such cases the apparent continuity of the mental life is apt to mislead, so that we may fail to observe or appreciate the changes which come with the appearance of morbid conditions. Their nature can only be appreciated by the help of related cases. We occasionally find that external depressing circumstances give rise not to melancholic but to maniacal symptoms, and that maniacal conditions are preceded by a preliminary state of melancholy. On the other hand, we find similar states of depression originating out of circumstances with which they were unconnected by any natural law. From cases like these we may perceive that the apparent continuity does not depend on psychical cause and effect, but upon physical conditions of whose method of action we may be ignorant. Unfavourable circumstances produce natural states of depression in healthy life, which pass away with the circumstances which originated them; but in the cases to which we refer they produce, through the intervention of morbid physical conditions, states either of exaltation or depression, which differ widely from the natural states, and which, when once established, are wholly independent of their natural antecedents.

In some instances the diseased feeling may attach itself to existing facts, whose natural effect on the mind harmonises with the morbid state, but the direction which is thus given to it is really accidental; the ideas, whether real or delusional, through which it finds expression, are not its causes, and the natural effect which these would produce on the mind affords no measure of its intensity. We must regard these states of feeling as independent of everything but the morbid physical condition, and as standing rather in the relation of cause than of effect to the ideas with which they are associated.

These states of depression, or perhaps more strictly, of mental pain (for we must always remember that although mania is indicated by excitement of feeling, and melancholia by depression of feeling, they are both expressive of excitement of feeling), range between simple feelings of gloom or apprehension and the most intense mental anguish, and often assume the special forms of suspicion, jealousy, or sense of personal injury. In every such case the intellectual powers are concurrently affected, either intermediately through the state of mental pain, or directly by the physical disease. The mind is quite inaccessible to ideas which do not harmonise with the prevailing mental tone. The faculties generally are sluggish in their action, and the circle of ideas is limited. The voluntary power is greatly weakened. The mind seems incapable of anything that requires effort, and its action is confined to lines which are habitual or which are marked out for it by the dominant feeling. In extreme cases we find that volition seems wholly paralysed, and the mental action is limited to a few ideas in which the dominant pain finds expression. Even in apparently slighter cases the mental limitation is distinctly marked. Ordinary duties may be performed, and the mind may still be capable of following customary lines of thought, but any new departure is impossible, except in connection with the morbid feeling.

The greatest difficulty is often experienced in appreciating correctly the intensity of these morbid states. When they are not entirely concealed, the mode in which they find expression must necessarily be often the same as in natural conditions. We are, as we have stated, entirely misled if we attempt to measure them by the possible effect which the ideas with which they are associated would have had upon sane men. The only way in which we can form an estimate of their force is by observing the influence which they exert on other mental states, and by the frequency of their results in action. The mere acuteness and persistence of the mental pain is often the cause of suicide. Very often also we find the conception of misery extended to those who are nearest to the sufferer, and forming the motive of homicide. Occasionally, violent meaningless crimes are committed which seem akin to the convulsive actions of a man suffering under bodily pain. In very many instances, however, we find that actions are determined not merely by simple states of feeling, but by ideas which have arisen under its influence, and serve as a channel for its expression.

We have already seen that the ideas which are associated with morbid states of feeling may be based on existing facts or taken over from the previous life, although in every case they are practically untrue on account of their dissociation from reality, and the one-sided predominance which, owing to their relation to the diseased feeling, they acquire over the mind; but in many cases we find the insane feeling giving rise to totally false ideas or delusions, of which the exact mode of origin is not easily traceable. The theory may be advanced that they are due to attempts made by the mind to explain the abnormal state of feeling. This suggestion appears to be most plausible in cases of hypochondria, where the character of the delusion is possibly determined by morbid states of bodily sensation. Some authorities, indeed, maintain that some special sensory condition of the general system underlies all delusions,—for instance, that delusions of smell are dependent on foul breath, that delusions of hearing are suggested by cardiac murmurs, and that such delusions as that the gullet is occluded are referable to some affection of the alimentary system. The theory is attractive, but there are many objections to it, not the least being that many painful and wearing diseases of the bowels and uterus are rarely productive of insanity; and when they appear in conjunction, the mental symptoms are much more probably due to the so-called "moral" effect of anxiety and brain exhaustion which are concomitants of the conditions. We believe that delusion is the product of the imagination, determined and limited in its working by the influence of the dominant state of feeling. This appears very clearly in the continually changing delusions of some states of mania, which very often resemble in their character the uncontrolled working of the imagination in dreams. In states of depression, as might be expected from the generally slow and restricted character of the mental working, delusions change less rapidly, and tend to run more in the same direction. Sometimes we may trace their content to previous circumstances or to current ideas, while in other cases we may entirely fail to detect their source; but in any event they are always in harmony with the prevailing feeling which keeps them continually before the mind, and prevents the interference of conflicting ideas.

In most acute cases, insane ideas or delusions make their appearance in connection with morbid states of feeling, although occasionally they seem to present themselves as primary symptoms. The class of cases, however, in which delusions form the most prominent symptom, generally belong to chronic stages of insanity which succeed the acute phase of the disease, and in which the excitement of feeling has wholly or partially subsided. Even when cases of disease terminate in recovery, we sometimes find that delusions linger, as a dream does for a moment after wakening, and do not entirely disappear until the current of healthy life has fairly set in; but in the large number of cases where the disease has caused permanent injury to the brain, we find these delusions remaining generally in connection with well-marked conditions of mental weakness. In many instances they seem to be the sole remains of mental life, so that except through them the mind can scarcely be excited to action. In other cases which retain a greater degree of mental activity, they form the dominant element in the mind, and subordinate everything to themselves. Occasionally they occur merely as a small group of persistent ideas which do not appear to interfere seriously with the rest of the mental life. In all these cases we trace the origin of the delusion directly or indirectly to some form of acute disease.

Apart from such so to speak acquired delusions, there exists a group of a distinctly marked hereditary type, which appear, so far as rigid observation has determined, to be the gradual product of a mind which has been weakened or rendered unstable by the presence of an insane element which is not easily traced or defined. We may not be able in such cases to detect any clearly marked mental disorder apart from delusion; at the most, we may perceive peculiarities and signs of excitability; but the mind seems liable to be possessed by ideas and lines of thought which are sometimes entirely false, and sometimes the exaggerated and distorted representation of actual facts. Such delusions are "systematised," progressive, and for the most part grandiose in character; but in certain cases they culminate in overt acts of violence, the outcome of their systematised and progressive character. The term Paranoia has been applied not only to the class possessing these characteristics, but to others which we believe bear no analogy to it. From a clinical as well as from a medico-legal point of view, the term is convenient if it includes a class in which the initial symptoms of acquired insanities are not present, in which hereditary predisposition is well marked, and in which the mental symptoms stated above are persistent. It is a numerically limited class, but one which comprises many historical cases of homicide and other violent acts, and as such demands future careful consideration, apart from the fact that its phenomena have important bearings on the theory and practice of law.

In whatever method insane ideas or delusions are generated, our main interest in them lies in the differences they present from analogous sane phenomena. That difference does not lie in the falsity of their content. We have already said that insane states of feeling occasionally find expression in ideas which may be at least partially true; and generally we may say that delusions (or fixed ideas, as they are sometimes called in these circumstances) may be founded on actual facts, or on ideas which may be shared by many persons who are not insane. We find such cases frequently amongst the hereditary class, and familiar instances of them may be found in those possessed of personal grievances which may be traced to circumstances which really existed, and in those whose insanity takes a political or religious direction and who cannot always be readily distinguished from mere enthusiasts. In such cases it is often extremely difficult to describe the delusion in terms which would not be applicable to ideas which might be held by sane persons, although there are generally peculiarities about them which clearly indicate their character to those conversant with the subject. The really important difference between insane ideas and those which have originated in a sane mind consists in the manner in which the former are fixed in the mind, and the influence which they exert over it.

(*To be continued.*)

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

◆

Surgical Diseases of the Abdomen: With special reference to Diagnosis.

By Richard Douglas, M.D. London: Rebman Ltd.

This is a work of sound, practical intent. It purports to be a systematic study of those conditions within the abdomen which require surgical relief, and it may be said to have included within its scope every disorder that could possibly be included under the designation of "surgical," with not a few that are usually regarded as being still within the jurisdiction of the physician. Taking the more commonly known lesions of the abdomen, we find here chapters on peritonitis, appendicitis, and gastric (called here "peptic") ulcer, very well filled with good practical lessons. On the other hand, conditions such as mesenteric thrombosis, cirrhosis of the liver, hæmaturia, and chronic Bright's disease can scarcely yet be claimed to have passed from the province of the physician. Not but what the paragraphs on these (we cannot call them chapters) are useful so far as they go, and of practical value for purposes of diagnosis; but surgical procedure has not yet, in them, got beyond the tentatively experimental stage, and their exclusion would not have lessened the value of the book. In like manner the important subject of hernia might well have been included in a volume of this scope, yet beyond touching upon the rare conditions of retro-peritoneal and diaphragmatic hernia, it is not dealt with.

As a treatise upon the diagnosis of abdominal diseases, however, which is its avowed object, this is a very sound work. The chapters on "Wandering Kidney," on "Peritonitis," both general and tuberculous, on "Appendicitis," and on "Intestinal Obstructions," to instance a few, are replete with information of the kind only gained by personal experience. Exception may be taken, however, to the section on gunshot wounds, where the considerable field of experience gained in the late South African campaign has not been utilised at all.

Two omissions greatly detract from the usefulness of the book. The author has expressly left out all discussion of surgical procedure, an omission which greatly invalidates its claim to be of practical value. As an operator himself, in the cases which he everywhere cites, the description of his technique would no doubt have greatly added to the interest of the work.

The illustrations, also, leave much to be desired. In point of fact, it may be doubted whether their presence adds at all to the elucidation of the text. Their technique is as good as in most American works, which is saying a good deal; but they illustrate little or nothing. One plate (VII. and XV.) does duty twice over, while Plate III., showing positions of the appendix, if it means anything but a joke, would indicate that the appendix may be be found at all the cardinal points of the compass.

These omissions appear to us to mar the practical value of the work. It is well printed, the bibliography, whilst chiefly dealing in Americans, as is natural, is fairly full, and the book is one which may well repay careful reading by either practitioner or specialist. C. E. Douglas.

The Nutrition of the Infant. By Ralph Vincent, M.D., M.R.C.P. London: Baillière, Tindall, & Cox.

Of books devoted to the question of infant feeding there is apparently no end, and scarcely a month passes but some new work on the subject makes its appearance. The volume now under review is based largely upon the teaching of Dr. Rotch of Boston, to whom the book is dedicated. The author considers that the plan of feeding infants upon milk, prepared by home modification, is so empirical as to be absolutely unreliable. The book is in the main a plea for prescription, or laboratory feeding, as largely adopted in America, and which the author declares has converted the most unsatisfactory into the most satisfactory part of his practice. We greatly doubt whether the methods recommended in this work will ever be generally adopted in this country, owing to the greater cost of the milk so prepared, and owing to the complexity of the process and the great variety of the percentages to be remembered, and which vary with every individual child and with each week of life. In order to carry out this system, the infant must be under the constant care of a physician, who needs weekly to specify the alkalinity of the milk, the percentage of fat, proteid, and lactose required, besides indicating the number of feedings and the temperature at which the milk is to be taken. The strongest argument, however, against this absolutely fixed and definite percentage feeding is to be found in the composition of mother's milk, which changes from hour to hour, thus indicating Nature's desire for a constant variety in the composition of the food supplied to the infant.

The writer strongly condemns the practice of boiling, sterilising, or pasteurising milk, believing that milk so treated is attended with the greatest danger to nutrition. Every one, we imagine, would be in hearty agreement with the author if it were possible to obtain a fresh, clean, and pure milk, but so long as the milk supply of our large towns is contaminated, in the manner so graphically described in this book, we prefer the lesser evil of heating the milk to the greater one of infection through this channel.

The concluding chapters of the book are occupied with descriptions of rickets, marasmus, and scorbutus,—diseases which owe their origin to improper feeding. The book is plentifully interspersed with tables of analysis of milk and the composition of the various percentage mixtures, which should prove of use to those who elect to give this method of feeding infants a trial. G. H. Melville Dunlop.

The Johns Hopkins Hospital Reports, Vol. xi. Baltimore: The Johns Hopkins Press.

Of the three articles in the present volume of the *Johns Hopkins Hospital Reports,* the most important and interesting is one embodying the results of an historical, clinical, and experimental study of pneumothorax, by Dr. Charles P. Emerson. A most valuable part of the contribution is the exhaustive introductory analysis of all that has been written on pneumothorax, in which Dr. Emerson has adopted the plan of abstracting, and in many cases abstracting very fully, all the papers and books on his subject which he has been able to find. The completeness of his work in this respect may be indicated by the fact that he gives no less than 358 abstracts, occupying 197 pages of the reports.

He follows his elaborate study of the literature with a summary of the history of the discovery of pneumothorax, and of the development of the theories regarding its production. In the succeeding chapters he discusses the etiology and pathology of the condition fully, and details a number of illustrative cases taken from the Johns Hopkins Hospital records. The results of original investigations which Dr. Emerson has made on the composition of the gas in pneumothorax, on the distension of the affected side, and on pleural cohesion, are embodied in the paper. Dr. Emerson must be congratulated on having so successfully completed an arduous piece of work.

Drs. Cook and Briggs record a number of clinical observations on blood pressure. By means of a simple apparatus, for which they claim accuracy as well as ease of application, they have investigated the blood pressure in a number of medical, surgical, and obstetrical cases, and have made a comparative study of the general stimulant measures in common use. Their conclusions as regards the action of alcohol are a little startling, for they maintain that, apart from its irritant qualities, when in concentrated solution, it has no stimulant action whatever on the circulation. They conclude also, from their observations, that the infusion of saline solution is quite useless as a means of raising blood pressure, except possibly in cases where free hæmorrhage has taken place. Their main thesis, that their instrument gives a more accurate indication of the variations in blood pressure than pulse palpation by an educated finger, may be true; but the fact that their results, in the great majority of cases, merely confirm those obtained without the use of apparatus, suggests that there is less necessity to substitute the sphygmomanometer for the index finger than they imagine. The volume is concluded by a short article on the value of tuberculin as a diagnostic agent in surgical cases, by Dr. Tinker. J. W. STRUTHERS.

Treatise on Diseases of the Skin, for the use of Advanced Students and Practitioners. By HENRY W. STELWAGON, M.D., Ph.D., Clinical Professor of Dermatology in the Jefferson Medical College, Philadelphia. Philadelphia and London: W. B. Saunders & Co.

THE literature of diseases of the skin threatens to become almost alarmingly extensive. Text-books innumerable make their appearance in rapid succession, and grow in size to encyclopædic proportions. The contributions made to dermatology in special journals as well as in those devoted to general topics are numerous, and in many cases valuable, while the truly marvellous results which have followed the employment of rays and light of different sources and kinds in disorders widely varying in aspect and nature, have much enhanced the interest attaching to a class of ailments of very frequent occurrence. Dr. Stelwagon has expended infinite pains in bringing together facts bearing on his subject from vastly divergent sources, and has produced a volume crammed with information. We have gone through it with considerable care, have read and re-read great part of it, and cannot find trace of any sins of omission of consequence. Some of the articles suffer from an excess of elaboration, epithets are heaped one on another like Ossa on Pelion, till the language becomes overburdened and unwieldy, and meaning is obscured from pure verbosity. There are, occasionally, too frequent repetitions of the same statement in but slightly altered terms, where such reiteration is not called for on account of emphasis. Hence the book is larger than necessary, and it feels so heavy in the hand that to peruse it with comfort it requires to be supported. As a work of reference it will be found most valuable; but it is too prolix even for advanced students, while for the practitioner it sometimes offers a rather ample selection of remedies, which can hardly in all cases have been sufficiently tested by the author. It is very freely and fully illustrated, the engravings in the text are of marked excellence, and the full-page half-tone plates give an admirable idea of the diseases figured by them. Most of the coloured pictures are drawn from Mracek's "Atlas," and are beautiful specimens of colour-printing. We congratulate the writer on his elaborate and painstaking addition to the lore of integumentary infirmities.

W. ALLAN JAMIESON.

Verhandlungen der achtzehnten Versammlung der Gesellschaft für Kinderheilkunde. By Dr. EMIL PFEIFFER. Wiesbaden: J. F. Bergmann.

WE have recently received a copy of the *Proceedings* of this society for the meeting held in 1901 in Hamburg. Considerable attention seems to have been paid to the question of diphtheria, and there are articles on the operative treatment of laryngeal and tracheal stenosis following intubation, on difficult decanulation, and on the after history of children surviving tracheotomy and intubation. The most valuable paper was one by Hecker on the detection of fœtal syphilis, in which he discusses the value of the macroscopic and microscopic findings. The most constant naked-eye appearance is the combination of enlarged spleen and osteochondritis. For microscopic investigation the most suitable organ is the kidney, which resists maceration longest. The characteristic lesion is the cellular infiltration of the walls of the cortical vessels.

F. J. CHARTERIS.

Die Therapeutischen Leistungen von Dr. Arnold Pollatschek. Wiesbaden: J. F. Bergmann.

THIS is an excellent year-book of therapeutic progress. It covers the whole field of medicine and surgery. The articles are arranged in alphabetical order, so that the book is well adapted for reference purposes. It is primarily intended for the busy practitioner, and consequently the chief weight is laid rather on the new developments in pharmacology, therapeutics, midwifery, dermatology, and minor surgery, than on the more special branches which, as a rule, do not come within the scope of the general practitioner. F. J. CHARTERIS.

Die Chloroforme und Aethernarkose in der Praxis. Von Dr. KOBLANCK in Berlin. Wiesbaden: J. F. Bergmann.

IN this little work we have a series of lectures on the theory and practice of anæsthetics, given by Dr. Koblanck to Professor von Bergmann's Surgical Class at Berlin. We have read them with pleasure and profit.

The author takes up, *seriatim*, the chemistry of the chief anæsthetics, their indications and contra-indications, physiological action, and general and special technique, and discusses them in a very instructive and satisfactory manner. He draws special attention to secondary death from chloroform—*Spättod durch Narcose*—and further, to remote toxic effects of chloroform, a subject to which little attention has been paid in this country. German technique as regards anæsthetics differs considerably from our own, and inhalers, with which we are unfamiliar, seem popular. T. D. Luke.

NOTES ON BOOKS.

Mr. Mummery's work on *The After-Treatment of Operations* (Baillière, London) will be heartily welcomed by house surgeons and by practitioners who may be left to carry out the after-treatment of patients operated upon by others. The difficulties inherent to the writing of such a book have on the whole been successfully overcome by the author, and although, as he anticipates, his methods will not meet with the unanimous approval of operating surgeons, the advice he gives may with safety be followed by those to whom the work is addressed. Among many excellent features may be mentioned the list of breathing exercises to be practised after operations on the thorax, and the various sections in the appendix on rectal feeding, diets, massage, and artificial limbs.

Another work of special interest to house surgeons, although it appeals to a wider public, is Mr. Pearce Gould's *Elements of Surgical Diagnosis* (Cassell & Co., Ltd., London), of which a third edition is now before us. Since the last issue in 1897, many important advances have been made in diagnostic measures, and the author has mentioned in the new edition most of these. Reference has been made to bacteriological diagnosis, skiagraphy, and the examination of the blood, but we miss any notice of cryoscopy, and the value of ureteral catheterisation seems inadequately appraised. In a work of this kind we should have expected some description of the technique of these various procedures.

A third edition of Dr. Haviland Hall's *Medical Examination for Life Assurance* (John Wright & Co., Bristol) is before us. The work has been considerably enlarged, and furnishes a useful and reliable guide to those engaged in assurance work.

The Physiognomy of Mental Diseases and Degeneracy, by Dr. James Shaw (John Wright & Co., Bristol), is a reproduction of certain papers written by the author during the last few years. It contains over fifty excellent photographic reproductions, arranged to illustrate the facial expression in various forms of insanity. The text is somewhat condensed and not always perfectly clear.

Lake's *Handbook of Diseases of the Ear* (Baillière, London) follows the usual lines of works on otology. Introductory chapters on the anatomy of the parts concerned, the examination of the patient, and individual symptoms and their import, are followed by the consideration of diseases of the external, middle, and internal ear. The author has succeeded in giving within reasonable compass a full and up-to-date review of his subject. The descriptions, although brief, are accurate, and the book is well illustrated.

RECENT ADVANCES IN MEDICAL SCIENCE.

◆

MEDICINE.

UNDER THE CHARGE OF

A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,
MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

DISEASES OF THE SUPRARENAL BODIES.

Suprarenal inadequacy.—In a paper entitled "Les surrénalités chroniques d'origine infectieuse et l'insuffisance surrénale lente" (*Arch. gén. de méd.*, Paris, January, 1904), Serjent tries to show that acute lesions of the suprarenal bodies, caused by toxæmia, may pass into a chronic condition, which manifests itself clinically by a group of symptoms due to inadequacy of the glandular function. The case on which the paper is based is that of a man, æt. 54, who complained of pain in the scapular region, and presented a somewhat cachectic appearance, combined with great lassitude and anæmia. Nothing could be found to account for his symptoms, and a few days after his admission to hospital he had an attack of aphthous stomatitis with fever, which was accompanied by great prostration. After the temperature fell the profound asthenia still continued, epigastric pain was complained of, and obstinate vomiting set in. Examination of the blood showed simply a diminution of the red corpuscles, neither leucocytosis nor evidence of leukæmia or pernicious anæmia. On questioning the patient, it appeared that he had suffered from typhoid fever two years previously, and had never quite regained strength. The anæmia, asthenia, vomiting, and epigastric pain led Serjent to suspect suprarenal mischief; no sign of tubercle in the lungs or elsewhere could, however, be detected. Treatment with suprarenal extract was accordingly tried, but without any decided benefit, and the patient died after about three months' residence in hospital. Apart from profound exhaustion, enfeeblement of the circulation, occasional syncope, and vomiting, the only noteworthy symptom was tetanic contraction of the masseter muscles on the day preceding death. At the autopsy no naked-eye lesion of any organ could be found, except that the suprarenal bodies were markedly cirrhosed, but showed neither hæmorrhages nor tuberculous foci. The case illustrates the principal features of suprarenal inadequacy, namely, asthenia, emaciation, anæmia, vomiting, abdominal pain, low blood pressure, subnormal temperature, collapse, and attacks of syncope. The tetanic condition of the masseters is regarded by Serjent as a sign of profound muscular exhaustion. We learn also that in such a case a trivial acute intercurrent affection may precipitate the end; it also illustrates the fact that an acute disease may leave behind it a chronic progressive lesion of the suprarenals. In these cases the lesion is strictly limited to the gland, the solar plexus escaping; the symptoms are therefore those of defective glandular action alone, the pigmentation characteristic of Addison's disease being absent.

In another paper ("Forme pseudo-méningitique du syndrome d'insuffisance surrénale aïgue," *Presse méd.*, Paris, 1903, tome ii. No. 94) the same author reports two cases in which signs of meningitis accompanied suprarenal inadequacy, due to tuberculous lesions. In each case the condition remained latent for a time, and then the symptoms described above as those of suprarenal insufficiency suddenly developed, there being, however, in addition, headache, photophobia, cutaneous hyperæsthesia, variability of the pupils, and other symptoms suggesting meningitis. On post-mortem examination, however, the meninges were healthy. Serjent notes especially that instead of a *tache cérébrale* a *pale* mark was produced by stroking the skin with the finger-nail in these cases. This he thinks is due to the fact that in suprarenal inadequacy the arterial hypotension is associated with capillary dilatation—exactly the reverse of what occurs in meningitis; attempts to elicit *taches* accordingly cause reflex capillary spasm in place of dilatation.

Suprarenal hæmorrhage.—Dudgeon (*Am. Journ. Med. Sc.*, Phila., January, 1904), discussing the etiology, pathology, and diagnosis of this condition, reports four cases:—(1) A child, æt. 2 years 8 months, who died of purpura, and in whom the post-mortem showed thrombosis of the cerebral veins, thymic abscess, and hæmorrhage into the left adrenal and kidney. (2) An extensive burn in a child of 6, with a large hæmorrhage into the right adrenal, accompanied by symptoms pointing to an acute abdominal lesion. (3) A child of 1 year 10 months who died of gangrenous varicella on the fourth day after the invasion of the disease, in whom the autopsy showed a double adrenal hæmorrhage, from which a pure culture of the pneumococcus was isolated; also tuberculous lesions in the bowel. (4) A case of sudden death in a child, æt. 14 weeks, from broncho-pneumonia, in whom a double adrenal hæmorrhage was found. In discussing the subject, the writer quotes some of the cases previously recorded, all of which were in children under 14 months. In most of these there was vomiting, diarrhœa, and pyrexia, sometimes with purpura, and in some purpura alone. Death invariably occurred within twelve, twenty-four, or forty-eight hours. First and foremost comes the question, Are these examples of fulminating small-pox?—a diagnosis which has been arrived at in some cases, suspected in others. The only strong evidence in favour of this rests on the fact that so frequently the children were unvaccinated (nine out of twelve cases). The symptoms are, however, compatible with any acute bacterial infection, or fulminating scarlet fever or measles, and no case is proved to have infected any other person with variola, whence Dudgeon concludes that we are dealing with an acute toxæmia of unknown nature. It would seem that adrenal hæmorrhage may have the following causes:—

(1) In many cases the term idiopathic may justly be applied. (2) Gastro-intestinal infection (in some acute cases, with purpura, possibly ptomaine poisoning). (3) In newly-born children. (4) Venous stasis, in chronic heart and lung disease, convulsions, etc. (5) Septicæmia, miliary tuberculosis, and toxæmia from burns. (6) Congenital syphilis (?) (7) Injury. (8) Blood diseases. (9) Chronic nervous diseases, *e.g.*, general paralysis. Bacteriological researches have so far thrown little light on the subject; the lesion having been produced experimentally by inoculation with the *Bacillus diphtheriæ*, *B. pyocyaneus*, etc., while pyogenic cocci, pneumococci, and *B. coli* have been isolated from the blood in post-mortems on cases in the human subject. Dudgeon has carefully examined the organs in various cases of general bacterial invasion, and has not, in any instance, found even microscopic hæmorrhages into the organs. Hæmorrhage appears under three forms—(1) Conversion of the whole gland into a blood sac, with extravasation into the surrounding tissues. (2) Medullary hæmorrhage, the cortex escaping. (3) Scattered hæmorrhages, especially into the medulla. The right gland is most frequently affected. It is unlikely that hæmorrhage has ever any association with Addison's disease; in most cases the symptoms are acute and rapidly fatal. Pigmentation is one of the cardinal signs of Addison's disease, while purpura very commonly accompanies suprarenal hæmorrhage.

LIPOMA OF THE INTESTINE.

THIS rare condition is dealt with by Ward in the *Albany Med. Ann.*, January, 1904, in an exhaustive paper, which contains practically all that is known on the subject. Although the disease from its infrequency can never be of great clinical importance, its interest is sufficient to justify a short abstract of Ward's paper. His attention was drawn to the subject by a case in which a man, æt. 37, passed by the bowel a soft, solid mass about 4½ in. long, consisting entirely of fat in a connective tissue framework. Ward excluded the possibility that the object was one which had been swallowed; he also concluded that it was not one which had ulcerated its way through the wall of the bowel, *e.g.*, fat necrosis of the pancreas, and therefore inferred that it must be a lipoma growing from the wall of the gut. His conjecture was strengthened by the subsequent progress of the patient, and by discovering records of some thirty-six similar cases. Briefly, the symptoms of his case were severe abdominal pain, tenderness in the region of the liver, and attacks of "biliary" colic with occasional vomiting. These symptoms, along with general disturbance of digestion, had already lasted for about two months, when the lipoma was passed, after which recovery quickly ensued. Ward has carefully summarised all the previous cases, and from these we abstract the following points:—The condition occurred in sixteen males and ten females, the sex being unstated in eleven cases. The disease is most frequent during the fifth decade, there being eleven cases at this age. Excluding cases in which the lipoma was found accidentally at an autopsy, it seems in most cases to give rise either to (1) colic, abdominal tenderness and constipation, usually lasting for some months (ten cases), or (2) symptoms of ileus (five cases), while in a few instances the symptoms were those of a rectal tumour. Twelve of the cases were complicated by an invagination of the bowel; in all but one of these (in which spontaneous expulsion of the tumour with a necrosed piece of gut took place) operation was required, usually on account of acute obstruction, but sometimes, it would seem, owing to the condition being recognised by palpation through rectum, along with the presence of more or less threatening symptoms. Spontaneous expulsion took place in nine cases; in six recovery ensued, in two the result is not stated. After excision of the tumour there were thirteen recoveries and no deaths; while in five cases in which resection of the gut was required, two cases were fatal from peritonitis. As to site: œsophagus and stomach, one each; duodenum, four, probably six; small intestine, twelve; colon, five; sigmoid flexure, two; rectum, four; unknown, nine.

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

LECTURER ON SURGERY, SCHOOL OF MEDICINE, EDINBURGH.

Intestinal Perforation in Typhoid Fever.

An exhaustive analysis of the literature of this subject, from the surgical point of view, is furnished by Harte and Ashhurst (*Ann. Surg.*, Phila., January, 1904). The first successful operation was performed by Mikulicz in 1884, and since then the recorded cases number 362 (94 recovered, 268 died—mortality, 74·03 per cent.). These cases have been very carefully analysed, and the results are tabulated at the end of the paper. The general results which come out may be briefly stated. About 2·54 of all cases of typhoid perforate. Perforation occurs oftener in males than in females (4 to 1), and the majority (54 per cent.) of the patients are between 15 and 30 years of age. Perforation may occur at any stage of the disease, but 56·6 per cent. occur during the second and third weeks; only 2 per cent. during the first week. It is difficult to estimate any ratio between the severity of the attack and the frequency of perforation, but it would appear that cases attended with tympanitis perforate oftenest. The most important exciting cause of perforation is exaggerated peristaltic action, induced, for example, by indiscretions in diet, purgatives, or enemata. Sudden movements in bed have determined perforation. With regard to the debated point, as to whether or not a "pre-perforative stage" can be recognised, the writers incline to doubt the possibility of recognising it either pathologically or clinically. The perforation is usually on the portion of the bowel diametrically opposite the mesenteric attachment, and in 236 out of the 271 cases the perforation was single. In over 73 per cent. it was within 12 in. of the cæcum, and in only 2 per cent. was it more than 3 ft. from the ileo-cæcal valve. There were twelve patients in whom a subsequent perforation occurred, and they all died. Where the typhoid bacillus alone has been present, the resulting peritonitis has been of a low grade, with lemon-coloured exudation, few adhesions, and little lymph. Where a mixed infection had occurred, there is more acute inflammation, with abundance of lymph and early and extensive formation of adhesions.

Clinically, the outstanding features have been—pain of a stabbing character in the right lower quadrant of the abdomen, the onset of vomiting with the pain, sweating, and a fall of temperature. Attention is drawn to the fact that in a certain proportion of cases in which perforation occurs, the patient has had for some days before attacks of sweating and sudden falls of temperature. Muscular rigidity is present, as in other forms of peritonitis. The pulse rises to 120 or 140, the respiration is entirely costal, and the facial expression changes. Local tenderness is always increased when perforation occurs. Dulness is a very uncertain sign. The authors do not attach great importance to the blood count as a practicable diagnostic measure. In drawing conclusions from the blood count, the normal leucopenia of the disease must be borne in mind. The differential count is of more value than the mere enumeration of the white cells as a whole, as there is a disproportionate increase of the polynuclear neutrophiles.

As regards *differential diagnosis*, this has most often to be made from hæmorrhage, which is not attended with pain or rigidity, and the blood is usually passed in the stools in the course of an hour or so. In doubtful cases operation should be performed, as the bleeding point, as well as a perforation, can be dealt with. The diagnosis from other forms of peritonitis, appendicitis, suppuration in the gall bladder, intussusception, and gastric ulcer can usually be made by a careful analysis of the symptoms.

From the point of view of *prognosis*, the most favourable cases have been those in girls from 10 to 15 years of age, the perforation occurring in the first week, or during convalescence; those operated on in the third hour after perforation, the perforation being single, pin-head in size, within a few inches of the cæcum, or in the appendix, and where neither fæcal extravasation nor adhesions were present. In such cases the mortality should be less than 50 per cent.

As well-authenticated cases of recovery after perforation without operation are extremely rare—if, indeed, they occur—the only *treatment* is by laparotomy and suture of the perforation. The authors prefer to operate under ether anæsthesia rather than with a local anæsthetic, and recommend a straight incision, about 4 in. long, through the outer half of the right rectus. The perforation is sutured with silk. Resection has been employed five times with only one recovery. Omental grafts should be applied over the line of sutures, and over ulcers which threaten or are likely to perforate. Free douching of the peritoneal cavity is recommended in preference to swabbing with gauze. Drainage should be employed in all cases with sterilised gauze, rather than with tubes, and the gauze may be left in for four or five days, or longer. Patients who live for twelve hours after the operation have a fair chance of recovery.

Exploratory laparotomy in doubtful cases is recommended.

TREATMENT OF NOCTURNAL INCONTINENCE OF URINE by RETRO-RECTAL INJECTIONS OF SALINE SOLUTION.

PATEL (*Ann. d. mal. d. org. génito-urin.*, Paris, January, 1904) records his experience of two cases of nocturnal incontinence, treated in Jaboulay's clinic by the injection of saline solution into the retro-rectal cellular tissue. The first case was that of a girl, æt. 25, who had suffered from infancy. During the day her urination was normal, but during the night she passed water involuntarily. There was no anatomical or physiological explanation of the condition forthcoming. All the ordinary methods of treatment failed to give relief. A hundred grms. of saline solution were injected into the retro-rectal space, and the following night the patient did not pass water in bed. The next night, however, she did, and a second injection was made, and since then (six months ago) the incontinence has entirely disappeared. The needle of the syringe is introduced at the tip of the coccyx, or to one side of it, and passed vertically upwards. A finger in the rectum guides the needle as it is passed in, and prevents perforation of the rectal wall. The fluid is slowly introduced. No anæsthetic is required.

The second case was also that of a girl, æt. 20, who suffered in the same way. After the first injection the incontinence disappeared for three days; after the second, for six days. The third injection (200 grms.) was followed by thirty days' continence, and after the fourth (also 200 grms.) there has been no return of incontinence. The treatment is based on the theory that the condition is due to some functional disturbance of the hypogastric plexus or its branches, which the author looks upon as "the brain of the pelvic viscera." The mode of action is not quite clear, but the fluid would appear to modify the function of the plexus in some way. Beneficial results have also been obtained from these injections, in cases of intractable sciatica and in neuralgia of the cauda equina.

ON ARTHRODESIS OF THE SHOULDER JOINT.

Vulpius (*Arch. f. klin. Chir.*, Berlin, Bd. lxix. Hefte 1 and 2) holds that it is important to operate in cases of infantile paralysis affecting the muscles governing the shoulder joint, where the power of movement of the elbow, hand, and fingers is good. In these cases he believes that little is to be gained by attempting to replace the deltoid by the trapezius and pectoralis major, on account of the anatomical conditions present, and that arthrodesis of the shoulder joint, resulting in firm union of the arm with the scapula, is the only satisfactory means of treatment. When firm ankylosis has taken place, the movements of the shoulder girdle replace to a great extent those of the shoulder joint, and the improvement in the usefulness of the arm is considerable. Vulpius has operated on six cases by this method, four of which have remained under observation for some years since operation, so that he has been able to note the ultimate results accurately. He finds that bony ankylosis follows a thorough operation, and maintains that this should always be aimed at, for incomplete ankylosis gives a much less favourable result. In successful cases the functional improvement is surprising; the arm can be flexed, extended, and abducted, and the hand can grasp objects at the level of the shoulder, and be brought up to the mouth without assistance from the sound arm. Arrest of growth in the humerus following the operation has not been seen. At least a year should be allowed to elapse after the onset of paralysis before operating, as it is impossible to be sure within that time that the paralysed muscles will not recover. The operation itself is carried out through a longitudinal incision. The cartilage covering the head of the humerus and the glenoid fossa is freely removed, and the under surface of the coracoid and acromion processes scraped. Removal of the capsule and free use of the sharp spoon are useful additional measures. Two silver-wire sutures are then passed through the humerus on the one hand, and the acromion and glenoid or coracoid on the other hand, to fix the head of the humerus firmly in position. After operation the arm is fixed for from ten to twelve weeks, with the elbow flexed to a right angle, and for two to three months afterwards a supporting apparatus is worn, and removed during that time only to allow of massage and movement being carried out.

A NEW METHOD OF REDUCING POSTERIOR DISLOCATIONS OF THE HIP.

ELGART (*Centralbl. f. Chir.*, Leipzig, 1903, No. 34) records a case in which he succeeded in reducing a sciatic dislocation of the hip by a new method, after having tried various manipulations, and the old traction method, in vain. The anæsthetised patient was laid on the floor, and the pelvis fixed by an assistant. Elgart then knelt on one knee beside the injured limb, and, flexing it at the hip and knee, placed his own knee against the popliteal region, so that he was able to use the patient's leg as a lever with which to manipulate the thigh. He then grasped the ankle firmly with one hand, and depressed it, at the same time pressing it outwards. In this way he exerted on the femur a strong vertical pull, combined with internal rotation. With his other hand he manipulated the head of the dislocated bone, and endeavoured to press it outwards, thus assisting its passage over the margin of the acetabulum. In the case he records, these manipulations succeeded in reducing the dislocation at once. Elgart claims that this method fulfils the necessary conditions well, inasmuch as an easily regulated traction can be made on the femur in a direction varying with the angle of hip flexion, and combined with rotation movements.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

F. W. N. HAULTAIN, M.D., F.R.C.P.Ed.,

PHYSICIAN FOR DISEASES OF WOMEN, DEACONESS HOSPITAL, EDINBURGH;

AND

J. A. C. KYNOCH, M.B., F.R.C.P.Ed.,

PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, ST. ANDREWS UNIVERSITY.

RETROVERSION OF THE UTERUS.

DUNNING (*Journ. Am. Med.*, Phila., November) publishes the results of treatment in 112 cases. Simple uncomplicated retroversion of the uterus gives rise to few symptoms, the chief of which are backache and

TISSUE BUILDING

BY

BOVININE

is most successful because **BOVININE** supplies absolute and perfect nutrition.

It not only stimulates, but completely feeds the new born blood cells, carrying them to full maturity.

It increases the leucocytes and thereby most powerfully retards pathological processes.

As a food and nutrient it is ideal, requiring little or no digestion, and being at once absorbed and assimilated.

For starving, anæmic, bottle-fed babies, its results are immediate and most gratifying, as it is a ready alimentation as soon as ingested, and never causes eructation.

It will be found equally reliable for nursing mothers, affording prompt nourishment and strength to mother and babe.

In typhoid fever and all wasting diseases it may be administered per rectum, and will sustain the strength and support the heart without need for recourse to alcoholic stimulants.

Records of hundreds of cases post free on request.

THE BOVININE COMPANY,

66 Hatton Garden, London, E.C.

YOUNG J. PENTLAND'S LIST.

TEXT-BOOK OF ANATOMY.

EDITED BY

D. J. CUNNINGHAM, M.D., F.R.S.,

Professor of Anatomy in the University of Edinburgh.

IN FOUR SECTIONS.

SECTION I. General Embryology — Osteology — Articulations or Joints — The Muscular System. Pp. xxxii.–438. Illustrated with 307 Wood Engravings, many printed in Colours, In extra cloth binding, price 12s. 6d. net.

SECTION II. The Nervous System—Organs of Sense and the Integument. Pp. vi.–344. Illustrated with 233 Wood Engravings, some in Colours. In extra cloth binding, price 10s. 6d. net.

SECTION III. Vascular System — Respiratory System — Digestive System. Pp. viii.–364. Illustrated with 184 Wood Engravings, many printed in Colours. In extra cloth binding, price 10s. 6d. net.

SECTION IV. Urogenital System — Ductless Glands — Surface and Surgical Anatomy. Pp. viii.–230. Illustrated with 99 Wood Engravings, some printed in Colours. In extra cloth binding, price 7s. 6d. net.

In Two Volumes, crown 8vo, cloth: Vol. I. Upper and Lower Limb, pp. xx.–605, with 205 Illustrations; Vol. II. Thorax, Head, and Neck, pp. xx.–607, with 225 Illustrations, price 10s. 6d. net, per Vol.,

MANUAL OF PRACTICAL ANATOMY. By D. J. CUNNINGHAM, M.D., F.R.S., Professor of Anatomy in the University of Edinburgh. Third and thoroughly Revised Edition. Illustrated with Wood Engravings, many in Colours, for the most part newly engraved for this Edition.

Third Edition, thoroughly Revised and Rewritten, crown 8vo, cloth, pp. xx.–548, with 150 Illustrations, price 12s. 6d.,

MANUAL OF BACTERIOLOGY. By ROBERT MUIR, M.D., F.R.C.P.Ed., Professor of Pathology, Glasgow University; and JAMES RITCHIE, M.D., B.Sc., Reader in Pathology, University of Oxford. [PENTLAND'S STUDENTS' MANUALS.

Second Impression, 8vo, cloth, pp. xvi.–614, price 16s.,

THE PRINCIPLES OF TREATMENT AND THEIR APPLICATIONS IN PRACTICAL MEDICINE. By J. MITCHELL BRUCE, M.D., F.R.C.P., Physician to, and Lecturer on the Practice of Medicine, Charing Cross Hospital; Physician, Hospital for Consumption, Brompton, London. [PENTLAND'S MEDICAL SERIES.—Vol. VI.

Third Edition, thoroughly Revised and Rewritten, crown 8vo, cloth, pp. xvi.–448, with 144 Illustrations, price 9s. net,

GIBSON AND RUSSELL'S PHYSICAL DIAGNOSIS. Edited by FRANCIS D. BOYD, C.M.G., M.D., F.R.C.P.Ed., Assistant Physician, Edinburgh Royal Infirmary; Physician to the Deaconess Hospital, Edinburgh.

In One Volume, royal 8vo, cloth, pp. 1040, price 21s. net,

TEXT-BOOK OF PHARMACOLOGY AND THERAPEUTICS. Edited by W. HALE WHITE, M.D., F.R.C.P., Physician and Lecturer on Medicine, Guy's Hospital, London.

In Two Volumes, royal 8vo, cloth: Vol. I., pp. xx.–1036, with 3 Plates and 93 Illustrations, price 31s. 6d.; Vol. II., pp. xxiv.–1365, with 449 Illustrations, price 42s.,

TEXT-BOOK OF PHYSIOLOGY. By BRITISH PHYSIOLOGISTS. Edited by E. A. SCHÄFER, LL.D., F.R.S., Professor of Physiology, University of Edinburgh.

Third Edition, thoroughly Revised and largely Rewritten, 8vo, cloth, pp. xvi.–744, with 46 Coloured Illustrations from Original Drawings, price 25s.,

DISEASES OF THE THROAT, NOSE, AND EAR. A Clinical Manual for Students and Practitioners. By P. McBRIDE, M.D., F.R.C.P.Ed., Lecturer on Diseases of the Ear and Throat in the University and in the School of Medicine of the Royal Colleges, Edinburgh. [PENTLAND'S MEDICAL SERIES.—Vol. III.

YOUNG J. PENTLAND,

EDINBURGH 11 TEVIOT PLACE. LONDON: 38 WEST SMITHFIELD, E.C.

bearing-down pains. Dysmenorrhœa occurred in 37 per cent. of the cases. The severity of the symptoms and the prognosis depend largely on the number and character of the complications. Uncomplicated cases are rare, amounting in Dunning's series to only eight patients. The most common and serious complications are prolapsed and inflamed ovaries, endometritis, and laceration of the cervix. Prolapse of one or both ovaries was found to be present in 42 per cent.; endometritis in 30 per cent.; laceration of the cervix in 24 per cent.; prolapse of the uterus in 15 per cent.; adhesions in 15 per cent. The less complicated cases yield satisfactory results when treated. Displacements of long duration with serious complications call for operative treatment, which is followed in many cases by cure. The dangers of operation are now very small.

LEUCOCYTOSIS IN DISEASES OF THE FEMALE REPRODUCTIVE ORGANS.

DÜTZMANN (*Monatschr. f. Geburtsh. u. Gynaek.*, Berlin, Bd. xviii. Heft 1) bases his conclusions upon 2000 blood counts made in 223 cases. In ninety of those the discovery of leucocytosis led to a diagnosis of suppuration, though examinations under an anæsthetic failed to discover a purulent focus. Blood counts were made in eleven cases of puerperal or post-operative exudates, in twenty-two of inflammatory diseases of the appendages, in nine cases of tuberculosis, in twelve cases of myoma or carcinoma, in seven cases of tubal pregnancy, in ten of ovarian cystic tumours, and in sixteen of puerperal and post-operative sepsis. Dützmann found that the leucocyte estimation is of value in the differential diagnosis between suppurative and non-suppurative diseases of the appendages. Tuberculous pus causes no leucocytosis, and gonorrhœa produces but a small increase in the number of leucocytes. An interesting point is, that in cases of large cystic ovarian tumours, specially where the pedicles have undergone torsion, there is marked leucocytosis without the presence of pus. Dützmann considers that in septic cases a persistent hyper-leucocytosis warrants a favourable prognosis. In eclampsia there is also hyper-leucocytosis, hence he regards this condition as being an infection.

SECONDARY SUTURE OF THE PERINEUM DURING THE PUERPERIUM.

THE usual teaching is, that the perineum must be sutured within twenty-four hours after the tear has occurred, in order that a successful result may be obtained. Abuladse (*Monatschr. f. Geburtsh. u. Gynaek.*, Berlin, Bd. xviii. Heft 4) has collected 129 cases from the literature, where, for one reason or another, suture of the torn perineum was not performed till from the second to the twenty-eighth day after delivery, and in those cases secondary suture was successful. In some of those cases the granulations covering the lacerated surfaces were removed with a sharp spoon before suturing, in others the wound surfaces were rawed by dissection, while in others the parts were simply rubbed with cotton-wool. Good results were obtained by all those methods. Abuladse recommends the following technique:—After disinfection of the genitals and vagina, he applies tincture of iodine to the granulation tissue, so as to destroy as many bacteria as possible, then puts in deep sutures, and before tying them scrapes away the granulations with a sharp spoon. The sutures are not removed for five or six days. In eleven cases thus treated by Abuladse healing was perfect, and no bad symptom showed itself. If there has been any infection of the wound or ulcerative process, it is necessary to wait until granulation tissue has appeared before attempting to suture the surfaces. On the other hand, there must not be any scar tissue formed, if a good result is to be obtained. Up to four weeks after labour, success was to be expected by the above lines of treatment.

In conclusion, Abuladse makes the following remarks:—(1) Secondary perineal suture must be carried out as a prophylactic against many gynæcological complaints. (2) The technique is simple, devoid of danger, and, as a rule, is followed by good results. (3) Secondary perineal suture is obligatory on every surgeon who sees a patient with an unhealed perineal laceration.

THERAPEUTICS

UNDER THE CHARGE OF
RALPH STOCKMAN, M.D., F.R.C.P.Ed.,
PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY;
AND
FRANCIS J. CHARTERIS, M.B.,
ASSISTANT TO THE PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY.

TREATMENT OF GASTRIC ULCER.

WAGNER describes the method gradually elaborated in Professor Lenhartz's clinique during the past seven years. The ordinary plan of a prolonged milk diet has been entirely given up. Instead, a concentrated diet, rich in albuminous materials, is employed. The persistent hyperchlorhydria is recognised as an important factor in causing the ulceration and pain. This hyperchlorhydria is best treated by large quantities of albumin, which combine with the free acid present, and give rapid relief from pain. As ordinarily carried out, the milk treatment is not sufficient nourishment, and the large quantities of fluid ingested tend to cause distension of the stomach, and to engorge the vascular system. Lenhartz finds that with the concentrated diet the pain is sooner relieved, and convalescence is much more rapidly reached. He has followed the plan even in hæmorrhagic cases, and in this paper Wagner publishes sixty cases thus treated, with only one death. For the first four weeks absolute rest in bed is essential, and immediately after the hæmorrhage an ice-bag on the abdomen is of use in preventing distension, and for the first few days bismuth subnitrate in 30-gr. doses may be frequently administered. From about the sixth to eighth day onwards, iron in the form of powdered Blaud's pill is indicated. Lenhartz's diet is interesting. Even on the day of hæmorrhage, he gives

200 to 300 c.c. of iced milk in teaspoonful doses, and along with this, one, two, or three whipped eggs. In exhaustion following hæmorrhage, the good effects are very evident. The quantity of milk is increased daily by 100 c.c., and an additional egg is given also; so that by the end of the first week the patient is receiving about 800 c.c. of milk and six to eight eggs daily. The quantity of milk never exceeds 1 litre. From the third to sixth day after the hæmorrhage, raw scraped beef is given in small amount mixed with an egg. By the end of the second week the patient can take well-cooked rice and softened biscuits, while after the third or fourth week a full mixed diet is allowed.

The following table shows the maximum amounts which can be given each day :—

Days after the last Hæmorrhage.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Eggs . . .	2	3	4	5	6	7	8	8	8	8	8	8	8	8
Sugar for egg (in grms.)	..	..	20	20	30	30	30	40	50	50	50	50	50	50
Milk (in c.c.) . .	200	300	400	500	600	700	800	900	1000	1000	1000	1000	1000	1000
Raw meat (in grms.)	...	..	..	..	..	35	2 × 35	70	70	70	70	70	70	70
Rice and milk (in c.c.)	..	..	..	..	..	..	100	100	200	200	300	300	300	400
Biscuits . . .	..	..	..	..	..	..	..	1	2	2	3	3	4	5
Raw ham (in grms.)	..	..	..	..	..	..	..	..	..	50	50	50	50	50
Butter . . .	..	..	..	..	..	..	..	..	..	20	40	40	40	40
Total calories . .	280	420	637	777	955	1135	1588	1721	2138	2478	2941	2941	3007	3073

In all, sixty cases of gastric ulcer with hæmatemesis have been treated. In forty-seven cases the egg diet was commenced within three days, in eight between the fourth and seventh day, while only five took more than a week. Thirty-seven patients received raw scraped meat within seven days. Only one case died. The pain diminishes very rapidly, and, as a rule, is completely gone within a week. In twelve cases it vanished in the first three days. The patients under this liberal diet rapidly pick up their strength, and fifty-two out of the sixty were able to stop treatment within two months. As regards the permanency of the cure, reports were obtained from twenty-five patients, and of these, eighteen were perfectly well and able to work. Only two had more bleeding. The histories of the sixty cases are fully given in the second paper.—*München. med. Wchnschr.*, Nos. 1 and 2, 1904.

THERAPEUTIC VALUE OF KIDNEY EXTRACTS.

RENAULT, in this interesting paper, points out that the kidney is no longer looked upon as a mere filter, but rather as a glandular secreting organ. The secreting function is chiefly localised in the striated epithelium of the convoluted tubules and descending loop of Henle. The epithelial cells extract certain substances from the blood and transform them into a series of new substances, which are contained in vacuoles in the cell substances. Two kinds are recognised, crystalloid and lipöid forms. The crystalloids do not stain with osmic acid, and are formed of mineral salts and non-albuminous nitrogenous substances soluble in water. The lipöid products are insoluble in water. Some are pure fats, others a combination probably of lecithin and albuminous substances. In the supra-nuclear region of each epithelial cell, one can see in the plasma small grains, so-called segregation grains. Colouring matter introduced into the blood becomes collected round them in the vacuole. The grain nourishes itself from this surrounding fluid, and grows at its expense; when it attains a certain size the grain is excreted into the urinary tubes. In the vacuole surrounding these grains, the transformation of the substances extracted from the blood takes place. In them can be seen the growth of the dialysable and soluble free products of renal excretion. The grain is capable of attracting to, and concentrating round itself, foreign material, which is removed with it on excretion of the grain. It is probable that the grain bears a special power of attracting and transmuting toxic substances contained in the blood, and that it also possesses a certain antitoxic effect. This antitoxic action is unaffected by ordinary gastric digestion.

Renault has removed these grains by macerating fresh kidneys, and has used these extracts in various diseased conditions. One or more, usually two, perfectly fresh kidneys of an omnivorous animal, *e.g.* the pig, is stripped of its capsule, minced, and thoroughly washed in distilled water to remove all urine. The minced product is then pounded in a mortar with 450 c.c. of normal saline solution, into which the grains readily pass without dissolving. The pulp is allowed to macerate in a mortar surrounded by ice for four hours. It is then decanted and administered in three or four portions during the twenty-four hours. The taste is not very bad, and the unpleasant flesh colour can be concealed in an opaque glass. The maceration contains the unchanged grains, and they therefore retain their power of acting as condensors for the retention products of the blood, changing them into substances more readily dialysable by a diseased kidney. The maceration should not be administered for more than ten days, after which a pause of four or five days is made. Otherwise, minor discomforts arise, such as gastric disturbance, urinary sweats, and skin eruptions. Renault has used the preparation in various forms of disease, and he illustrates its action in cases of chronic nephritis, interstitial nephritis, and cardiac albuminuria with secondary kidney changes. He shows that in urinary insufficiency the maceration of kidney is one of the most active and efficacious remedies hitherto tried. The diuretic effect is rapidly produced and does not result in any deleterious action with damaged kidneys. It reduces the albuminuria by restoring the activity of the kidney, while, in addition, it is an antitoxic remedy of the first class. If it is administered too long, it gives rise to certain symptoms of mild intoxication, but, in the numerous experiences of Renault and his pupils, it has never caused any grave trouble. The antitoxic action is shown by the steady disappearance of the hypertension, galop rhythm, and cardiac dilatation.

While not intending that it should be substituted for the ordinary forms of treatment, Renault thinks that it should be tried at the commencement of all cases of nephritis. It can be added to the other methods of treatment.—*Bull. Acad. de méd.*, Paris, 1903, No. 42.

DEATH DURING GENERAL ANÆSTHESIA WITH ETHYL CHLORIDE.

ETHYL CHLORIDE appears to be one of the safest anæsthetics. Thus Ware collected 12,436 cases with one *bonâ fide* death, while M'Cardie was able to mention 11,000 cases with only one death. The present case was a nigger, an epileptic, who had an incarcerated hernia. Anæsthesia was started with ethyl chloride, and narcosis was approaching after three or four minutes. Just as the change to ether was to be made, the patient gagged, and vomited an enormous quantity of clear watery liquid, which came up in a continuous stream without any inspiratory effort or retching. The vomiting could not be controlled, and must have lasted for two or three minutes. Respiration could not be re-established, despite artificial respiration and traction of the tongue. No air seemed to enter the lungs. There was no autopsy. The ethyl chloride was sprayed upon gauze held over the patient's mouth and nose. About 15 grms. were used.—Allen, *Am. Journ. Med. Sc.*, Phila., Dec., 1903.

MERCURIAL NEPHRITIS.

SWAN reports a case which illustrates in a striking manner the serious results of the over-administration of mercury. A widow, æt. 31, suffered for many years from a recurring eruption supposed to be syphilitic in nature. It was treated with iodides and mercury (at first by the mouth, latterly by inunction also). Mercurialism with sore teeth, fœtid breath, nausea, and deep-seated pain in the legs and abdomen quickly developed, but passed off on withdrawing the mercury. It was resumed again, and, after five months' treatment, kidney symptoms appeared, œdema of the feet, dyspnœa, and frequent scanty micturition. The urine contained albumin, 1·4 per cent., epithelium and hyaline casts. The eruption was unaltered. The case first came into Swan's charge at this stage, and he thought that the kidney was involved in the syphilitic changes and prescribed mercury in large doses. Oral administration caused nausea and sleeplessness. Inunctions of grey ointment caused, in addition, fœtid breath and œdema of the extremities. A consultation was held, and it was agreed that the diagnosis was wrong, and that the primary skin disease was probably psoriasis. All mercury was immediately stopped, but the patient continued to eliminate mercury for one year and twenty-nine days thereafter, though hot salt-water baths were employed to stimulate the cutaneous excretion. During the progress of the case there were several exacerbations characterised by diminished secretion of urine, increase of œdema, and nausea, vomiting, and headache. These acute symptoms passed off under rest in bed, hot baths, and liquid diet. Eventually the patient made a fair recovery.

She now passes normal quantities of urine, containing only 0·025 per cent. albumin, while there are now only a few granular casts but considerable quantities of epithelium. Swan has collected several cases of nephritis due to mercury, and describes them at the end of his paper.—*Am. Journn. Med. Sc.*, Phila., 1904, No. 1.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

R. F. C. LEITH, M.B., F.R.C.P.Ed.,

PROFESSOR OF PATHOLOGY, THE UNIVERSITY, BIRMINGHAM.

THE INFLUENCE OF SPLENECTOMY ON THE LEUCOCYTES OF THE BLOOD IN THE DOG.

Nicolas and Dumoulin (*Journ. de physiol. et de path. gén.*, Paris, November, 1903) experimented on two dogs, and came to the following conclusions:—(1) There is an increase in the number of white cells, which persists for a long time after the operation, and only returns to normal after several months. (2) There is an immediate diminution of the lymphocytes following upon a transient elevation, and this diminution becomes marked and prolonged in time. This fact is important in showing the *rôle* of the spleen in the genesis of lymphocytes. (3) There is a very slight variation in the number of the polymorpho-nuclear cells. (4) There is sometimes a marked eosinophilia.

THE QUANTITATIVE BACTERIOLOGICAL EXAMINATION OF WATER.

Ruata (*Sperimentale*, Firenze, 1903, tomo lvii. pp. 371–388) has criticised the methods at present used for the quantitative estimation of the number of bacteria present in water, and has suggested modifications of them which tend to simplify the procedure. He lays stress upon the importance of the degree of dilution used in examining an impure water, and shows that the bacteriological findings will largely depend upon this dilution. An impure water, like a sewage affluent, will give a much larger bacterial count with a high than with a low dilution. This is an important practical point, which experience has already taught many workers in this country.

THE DIAGNOSTIC VALUE OF CELLS IN FLUIDS.

Czerno-Schwarz and Bronstein (*Berl. klin. Wchnschr.*, August 24 and 31, 1903) comment upon the great value, clinically, of the microscopic examination of fluids obtained from the body in disease. It is not to be used critically or scientifically, but clinically. In some cases, as in ascitic fluids, its results are still very perplexing, but in pleural effusions it is often of value. In many affections of the central nervous system the cerebro-spinal fluid is normal, as in the neuroses, psychoses, and peripheral neuritis, but in others, as in general paralysis and early tabes, there is an increase of lymphocytes. At the commencement of tuberculous meningitis the polymorpho-nuclear leucocytes are increased, but later it is the lymphocytes, while the polymorpho-nuclears are alone seen in epidemic and infectious meningitis.

THE POISON CONSTITUENTS OF DIPHTHERIA TOXIN.

THE particular mode of action of antitoxic serums was discussed at the Congress of Hygiene in Brussels, in September 1903, and Ehrlich (*Berl. klin. Wchnschr.*, August 31 and September 14, 1903) held that the following findings had an important bearing on the question :—(1) The diphtheria bacillus produces different kinds of poison, in particular both toxins and toxones. (2) The affinity of the diphtheria toxin for antitoxin is very great. (3) If the saturation of the diphtheria toxins by the antitoxin is not complete, other substances, called toxoid, result from the presence of the surplus toxins in the bouillon. (4) This preformed toxoid may account for the different affinities shown by several toxins for antitoxin, for the haptophore group does not undergo any change in the formation of the toxoids.

IMMUNITY BY MEANS OF DIPHTHERIA BACILLI.

LIPSTEIN (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 1903, Erste Abth., Bd. xxxiv. S. 421–428) studied the agglutinating and bactericidal properties found in the rabbit's blood, under the influence of the injection of diphtheria bacilli. He obtained serums which agglutinated the bacilli, but they did so unequally, according to the particular race or stock, some races being very strongly agglutinated, others slightly, and others not at all. He thinks that, by the use of such serums of different valency, it may in this way become possible to distinguish between diphtheria bacilli of different origins. Certain results, obtained by other authors, read in the present light, support this view. He did not succeed in showing that the blood of immunised rabbits contained any bactericidal substance when he used guinea-pigs as test animals.

ACTION OF THE TOXIN AND ANTITOXIN OF DIPHTHERIA.

L. G. SEMON (*Arch. de méd. expér. et d'anat. path.*, Paris, November, 1903) concludes from experiments and observations as to the actions of diphtheria toxin and antitoxin upon the blood and blood-forming organs as follows:—(1) Diphtheria toxin injected in fatal doses causes an early and extensive degeneration in all the blood-forming tissues. (2) In small doses (permitting of spontaneous recovery) it provokes changes which follow in this order—(*a*) It destroys a certain number of the polymorpho-nuclear neutrophiles, their débris being eaten by the macrophages of the internal organs. This hypoleucocyte phase comes on immediately after the injection. (*b*) Against it the organism reacts and produces an increased number of leucocytes, giving a stage of leucocytosis. (*c*) During convalescence this excess of leucocytes is destroyed by the macrophages. The destruction extends to the red cells which fall below normal, and to counteract it there is an increased production of nucleated red cells in the bone marrow. (3) Anti-diphtheritic serum injected alone also provokes changes in the blood and blood-forming organs. The reaction cycle created is the same, only shorter than that which follows upon diphtheritic toxin in small doses. (4) In the course of a confirmatory case of diphtheria, injection of the therapeutic serum superposed its action on that caused by the diphtheria. It provoked a new and slight destruction of polymorpho-nuclears which was followed by an exaggerated compensatory reaction. This showed itself in the blood by a hyper-leucocytosis, and in the spleen by the appearance of giant cells. In grave diphtheria, the organism is not able to react to the serum, the attempt at cellular proliferation being only slight. If these views are correct, we must believe no longer that the toxin is simply neutralised in the blood by the injected antitoxin, but that the latter further causes a certain reaction in blood-forming organs of the patient. In a footnote he refers to similar results obtained by his colleague Balthazard in typhoid fever.

THE ACTION OF TYPHOID TOXIN, AND ANTITOXIN.

BALTHAZARD ("Thèse," Paris, 1903) used representative toxins, *i.e.*, obtained by setting free the intra-bacillary products. Subcutaneous injection of doses of 2 c.c. to 3 c.c. rapidly killed rabbits and guinea-pigs. Injection of non-fatal doses in the rabbit immediately caused an intense leucocyte destruction, chiefly of the polymorpho-nuclear neutrophiles, followed in about two to three hours by new-formed polymorpho-nuclears, neutrophiles, and by finely granular myelocytes, then a new destruction of leucocytes between the seventh and eighth hours, and finally a persistent hyperleucocytosis. The spleen by its macrophages removes the dead or dying leucocytes, but forms only myelocytes. The same thing may take place in lymphatic glands and the lymphoid tissue of the intestine when the injections are repeated. The bone marrow presents a neutrophile and eosinophile reaction which persists for fifteen days. This fixation of the toxin by the polymorpho-nuclear leucocytes protects the delicate glands and nerve cells, which are hardly touched. The destruction of the leucocytes in the spleen liberates nucleo-albumins, which are to be found in the urine, and lecithins which reach the liver and produce hepatic fat. When this action of the leucocytes is hindered or insufficient, the toxin attacks the nerve cells, and death follows. Immunisation by means of repeated injection of toxins renders the polymorpho-nuclears more resistant, and the bone marrow more active, and enables the animal to resist doses which would prove fatal to a fresh animal. In man the means of defence are the same, there being only minor differences. Chantemesse's antityphoid serum possesses a high agglutinating power; it is not bactericidal *in vitro*, but it has an antitoxic action when injected before or with the toxin. When injected after the toxin, its power diminishes as the interval after the entrance of the toxin increases. This serum acts by rendering the leucocytes less sensitive to the action of the toxin and by increasing the reaction of the blood-forming organs. In the typhoid patient it produces a growth of neutrophile and eosinophile leucocytes and an increase of the agglutinating power. It confers a passive immunity of ten to twelve days' duration. The doses used for man do no harm to rabbits.

THE PROPAGATION OF TYPHOID FEVER BY BUTTER.

AUTHORS vary as to the time the typhoid bacillus will live in butter. Heim puts the period at three to four weeks, Laser at six days, Fränkel and Kister at twenty-four hours. Carl Bruck (*Deutsche med. Wchnschr.*, Leipzig, June 25, 1903, Bd. xxix. S. 460) has given the results of some experiments of his own. He added three loopfuls of a 24-hour old agar culture of the typhoid bacillus to 500 c.c. of milk, and was able to find the bacilli abundantly in the cream, the butter, and the whey, and still alive at the end of twenty-seven days. He got similar results when the milk was not contaminated, but merely the water used in washing out the butter-making machines, and also when the utensils of the creamery were scrubbed out with linen cloths soiled by the dejections of a typhoid fever case. He thinks that suspicion should fall upon the milk or butter in cases of typhoid where a water origin can be apparently excluded.

THE POLYVALENCE OF ANTISTREPTOCOCCIC SERUM.

PIASSETZKA (*Arch. de méd. exper. et d'anat. path.*, Paris, 1903, tome xv. p. 589) has experimented upon rabbits with a view to determine whether an antistreptococcic serum, obtained from using one race of the streptococcus, would act against another race, or a heterologous streptococcus. His work in the main corroborates that of J. Courmont (*Compt. rend. Soc. de biol.*, Paris, 1897 and 1898), but he has not referred to it in the bibliography given at the end of his paper. He found that antistreptococcic serums (rabbit) agglutinate completely the streptococcus employed for the immunisation (homologous streptococcus), that heterologous serums, on the other hand, do so incompletely or not at all. The bactericidal power of the antistreptococcic serums of the rabbit or the horse, when homologous streptococci are used, is already pronounced *in vitro*, but is not increased by the addition thereto of leucocytes. Heterologous serums are inactive. Likewise in the animal body, heterologous serums are without effect, while homologous may bring about recovery in rabbits. Other workers have found that, after immunisation of an animal with several kinds of streptococcus, a serum is obtained which is active not only against the kind of streptococcus employed, but also against other varieties.

DISEASES OF THE EYE.

UNDER THE CHARGE OF
GEORGE A. BERRY, M.B., F.R.C.S.Ed.,
OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY;
AND
W. G. SYM, M.D., F.R.C.S.Ed.,
ASSISTANT OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY.

The Mechanism of Accommodation.

It may be fairly enough stated that, as a practical matter, Helmholtz's provisional explanation of this difficult problem has hitherto held the field, for, though Tscherning and others have suggested different theories, their followers have been comparatively few. Grossmann (Liverpool) recently met with a patient whose case was one in which, by a most extraordinary series of fortuitous circumstances, a number of valuable, indeed necessary, conditions were simultaneously present, enabling the observer to watch with a precision, hitherto unattainable, the changes in the crystalline lens during accommodation.

The patient was young, and therefore had a large amplitude of accommodation; he was intelligent, and could be relied upon to act in the way desired; he had congenitally no iris whatever, and therefore the whole face of the lens was exposed; yet he had no glaucoma, which is not infrequently the accompaniment of congenital absence of the iris; the cornea and lens were of normal size and (with the exception to be stated immediately) transparency, and he had very small opacities at the anterior and posterior pole of the lens, which afforded landmarks or fixing points, enabling Grossmann to make sure of the movements which took place. When it is added that the young man, though he had no iris, had no photophobia, and could bear without discomfort the incidence of bright light upon the eye, it will be admitted that the case was an almost ideal one for the investigations which Grossmann, with great care, with most laudable precision, with perfect open-mindedness, and with admirable patience, has carried out. The two rival theories which go by the names of Helmholtz and Tscherning, though in neither case was the observer named the actual originator, are that accommodation is produced by *relaxation* of the zonule (Helmholtz), and by *tension* of it (Tscherning); in favour of neither had Grossmann any prejudice, his aim simply was to discover the truth. When eserine was instilled, the lens, which had been homogeneously red, as seen with the plane mirror, became divided into three areas—a central and an outer one of perfect transparency, and an intermediate zone of shadow. This could be nothing other than the expression of a difference of refraction between the ring on the one hand, and the more central and more peripheral areas on the other. It is a proof that, in this respect at least, Tscherning is correct, and that the anterior surface of the lens assumes the form of a cone rather than of its rest-position, namely, a sphere. At the same time, that is when eserine is instilled, there is slight tremor of the lens, which can be very clearly made out, thanks to the minute "chalk-marks" on its anterior and posterior surfaces. This tremor is not present, except during extreme accommodation. At the same time, also, the equator of the lens decreases considerably in size. This fact of itself is sufficient to prove that accommodation of the lens can hardly be due to *tension* of the suspensory ligament, and that therefore on this point Tscherning is wrong. Further, if the circumferential measurement of the lens diminishes during accommodation, it becomes practically certain that the thickness of the lens must increase, and by an ingenious method, depending for its success upon the small anterior and posterior polar opacities, Grossmann was able to bring definite and clear physical proof that this is the case. In a similar manner it was shown that the anterior surface of the lens approaches the cornea during accommodation, but the lens as a whole does not do so, for, owing to the degree of thickening, the posterior surface recedes to an extent rather greater than the advance of the anterior. Under the influence of eserine, the lens, as stated above, became slightly tremulous, a feature which was first observed in the normal eye by Hess, who perfectly correctly found in the fact another proof that during accommodation the suspensory ligament is relaxed. He found, too, that the lens descended, whether the head was held erect or laid on one side. In Grossmann's present case, there was a clear movement of the lens upwards and slightly inwards; since observing this, the author has made very numerous investigations on normal cases, and finds that during accommodation the pupil travels upwards and inwards through a slight excursion. This will account for the fact of Hess noting only a downward movement, for the other would be masked by the alteration of the position of the pupil.

The images formed by reflection from the posterior surface of the lens now were made the subject of most careful examination, when it was found that if the doubled images of a powerful light were allowed to fall close to the posterior pupil of the lens, they came nearer together during accommodation, as has been observed before, but where they are caused to fall near the periphery, they become separated during accommodation. This of course proves that the central part of the lens becomes more acutely convex, while the peripheral becomes flatter—the lens assumes, in fact, a condition of posterior lenticonus as well as of anterior lenticonus. The case is one of immense interest as affording extraordinary facilities for such valuable work.—*Ophth. Rev.*, London, January, 1904.

CONGENITAL WORD-BLINDNESS.

THE literature of congenital word-blindness has two very interesting features, if we are to credit Wernicke (Buenos Ayres) entirely, for up to now it is very scanty and it is entirely in English. Wernicke now, however, records two cases in which he diagnosed the condition. The first was that of a young lady (19) of Danish descent, who is said to have been always somewhat hysterical, but in whose family there was no neurotic taint, so far as could be ascertained. Although her acuteness of vision was found to be up to normal standard, she had never been able to read properly at all; it had never been sufficiently easy to her to enable her to read with any degree of pleasure, for the labour of making out the meaning of the signs far outweighed any interest in the book. Her fundus and her amplitude of accommodation were alike normal, and correction of her hypermetropia (1·5 D) gave no improvement. Her intelligence was good; she could speak two languages correctly, and could work with figures easily; education had been almost entirely conducted by the ear. The second case was that of a boy of 10, who seemed bright and intelligent, and was reported to have an excellent memory, but who had not got on well at school. For one thing his health had never been good, and he had missed much in that way, but at any rate reading was almost impossible. He was anxious to learn, was a good arithmetician, could remember a paragraph read to him with wonderful accuracy, could copy from a book quite correctly, but could neither read nor write to dictation—letters, syllables, and even words would be left out by him. The reading and writing of numbers was quite easy to him, a fact which at once showed that his disability was not due to defective sight in any way; his acuteness of vision was normal. The boy came of a neurotic stock; his father had been somewhat dissipated, and one brother of the patient was weak-minded, but another was a "show" chess-player. In a number of previously recorded cases this fact has been observed already—that the patient came of a neurotic family stock. Up to now, eleven cases have been reported. Education in such cases ought to be chiefly oral.—*Centralbl. f. prakt. Augenh.*, Leipzig, September, 1903.

BILATERAL BLINDNESS FOLLOWING MEASLES.

MEASLES is of course apt to be complicated by inflammation of the cornea and conjunctiva, as every one knows, but apart from that the disease may bring about damage to vision in other and less obvious ways. A form of retrobulbar neuritis, due apparently to the toxines present in the system, may be to blame; so may a nephritis which has complicated the former. In very rare cases blindness appears to have been due to a cortical lesion. Rollet of Blois records a case deserving of notice; it was that of a girl, æt. 13, who acquired measles during an epidemic in the district. She had the disease mildly, it ran its usual course, and she was out of doors again having had no eye symptoms whatever. But one day she felt extremely drowsy while sitting under a tree, dropped off to sleep for a very brief period of time, and awoke to find herself completely blind. In the fundus the only pathological change he could detect was that the discs were of a strange orange-yellow hue, dull and waxy-looking. This waxy-yellow appearance was present nearly all over the fundus; only about the macula and round the disc itself the colour was more towards grey; the vessels were extremely small. The aspect suggested that the appearances were not all quite recent, they looked as though they were part of a chronic process, but no previous symptoms were admitted by the patient. The urine contained a trace of albumin, but she had no other signs suggestive of uræmia. Some months later, the vision being still as it was when she was first seen by Rollet, there were further changes in the fundus suggestive of retinitis pigmentosa.—*Clin. Ophth.*, Paris, July, 1903.

REPORTS OF THE MEDICAL SOCIETIES.

◆

Edinburgh Medico-Chirurgical Society.—*February* 3, 1904.—Professor **Chiene**, C.B., President, in the chair.—Mr. **Dowden** showed —(1) A patient after laceration of the arm; (2) a patient after osteomyelitis of tibia and secondary infection of the knee-joint.—Mr. **Alexis Thomson** showed a patient after transplantation of tendons for infantile paralysis.—Mr. **Scot Skirving** showed the skull of a patient exhibited to the Society five years ago, showing total necrosis of the frontal and partial necrosis of the parietal bones, resulting from syphilis.—Dr. **Lovell Gulland** read a paper on the "Glycogenic Reaction in the Blood." After a brief review of the history of the reaction, he went on to describe the nature of the reaction and the method of applying it. The glycogen granules are embedded in the cell substance. It occurs not as pure glycogen, but as glycogen combined with proteid, in all probability. Dr. Gulland then described the conditions under which the reaction occurs. For instance, it is present in croupous pneumonia, but absent in dry pleurisy; present in broncho-pneumonia, but absent in bronchitis. It is constantly present in all suppurative processes. It is well marked in cases of appendicitis requiring operation, not so in the mild cases. Dr. Gulland also pointed out that in some cases where a high leucocytosis occurs there may be no pus, and here the glycogenic reaction comes in useful.—Dr. **Stuart M'Donald** read a paper on "A Case of General Streptothrix Infection." The patient was a woman, æt. 65, whose symptoms led to a diagnosis of pleurisy. She was admitted to the Royal Infirmary. Coma supervened, and she died in two days. At the post-mortem, the main lesion was found to be in the lungs, the appearances found being strongly suggestive of miliary tubercle, there being minute nodules scattered throughout the lung substance. There were lesions in other organs which suggested a general pyæmic infection, for the kidneys showed pyelitis and distinct abscess cavities, and there were eight or ten abscesses in the brain. The organism found resembled that found in actinomycosis, but subsequent investigation showed that it was not the ordinary streptothrix. Various experiments on animals resulted in similar nodules being found in the organs. The organism stains best by Gram's method, and is both acid-fast and alcohol-fast, thus resembling the tubercle bacillus. It, however, gives a very luxuriant growth on beef agar. Dr. M'Donald concluded by advocating more careful bacteriological examination of the sputum in doubtful cases.—Dr. J. V. **Paterson** read a paper on "Glaucoma and the Glaucoma Theories." He first described the anatomy of the parts of the eye connected with the secretion and elimination of the aqueous humour, and also referred to some experimental work he had done to determine the source of the aqueous, the normal rate of secretion, and the paths by which the fluid leaves the eye. Glaucoma may be primary or secondary. The latter is easy to understand, as it is due usually to evident mechanical causes obstructing the flow of the aqueous. This is seen in iris bombé, traumatic cataract, intra-ocular tumours, etc. Primary glaucoma is much more difficult to explain. One does not remove the eye for acute glaucoma. It is only in the later stages of the disease, when the eye is quite useless, that enucleation is performed, and it is then difficult to determine the priority and importance of the lesions found. The lesions found, on which most stress has been laid, are—(1) Cupping of the disc, with accompanying optic atrophy; (2) closure of the filtration angle; (3) changes in the blood vessels. Dr. Paterson then referred to the various theories held regarding glaucoma, and pointed out that not one of them was adequate to explain the occurrence of the condition. He thought that the best hope of a solution lay in examining the relationship of glaucoma to general vascular disease and in careful examination of the blood pressure, venous as well as arterial.

EDINBURGH OBSTETRICAL SOCIETY.—*February* 10, 1904.—Dr. BREWIS, President, in the chair.—Dr. HAULTAIN showed—(1) Uterus with large adherent ovarian tumour, removed from a woman æt. 70. (2) Adenocarcinoma of the uterus, removed from a patient æt. 25. The uterus had been curetted three times before he saw her, and he did it twice. Still hæmorrhage recurred, so that the patient became very anæmic, and he was obliged to remove the uterus. On microscopic examination, there proved to be a deep penetration of the muscular wall by the glands of the endometrium at one part. (3) Fibro-myomatous uterus with adenocarcinoma and double ovarian tumours; interesting because of the variety of growths present. (4) Fibro-myomatous uterus and solid ovarian tumour, a form of tumour not yet understood, pathologically malignant, clinically benign. (5) Large fibro-myomatous uterus, removed for reflex laryngismus stridulus, with resulting cure. The tumour itself gave rise to no local symptoms. (6) Uterus with large cervical fibroid growing from the posterior wall. (7) Solid tumour of the uterus showing telangiectatic cavities.—Professor SIMPSON showed—(*a*) Fibroid tumour showing calcareous degeneration. In the centre of one of the myomatous masses fatty degeneration was going on. There were also some cystic cavities with epithelial lining. (*b*) Fallopian tubes showing salpingitis.—Dr. LACKIE showed—(1) An interstitial fibroid, removed on account of severe pressure symptoms; (2) a blighted ovum. The amniotic sac was complete, but there was no trace of an embryo. The patient, æt. 47, was nine weeks pregnant, and the ovum had at first sight the usual appearances of a two months' abortion.—The PRESIDENT showed—(1) Large pyonephrosis; (2) tuberculous kidney and ureter; (3) two tumours of the suprarenal capsules; (4) two tumours of the round ligament; (5) fibroid tumour of the vagina; (6) various ovarian and uterine tumours.—Dr. BERRY HART read a "Note on a Case of Hebotomy (Lateral Section of the Pubes)." The patient, a 2-para, had been delivered by craniotomy four years before. The operation of hebotomy was successfully carried out, but the patient died three days afterwards from the effects of chloroform, as demonstrated by post-mortem examination. The pelvis was a flat, non-rickety one. Dr. Hart described the steps of the operation, and contrasted it with symphysotomy.—The PRESIDENT read a paper on "Some Renal Cases," and gave records of the most interesting cases of renal tumours he had dealt with. The specimens he had previously shown were used in illustration of his paper.

Glasgow Medico-Chirurgical Society.—*February* 5, 1904.—Dr. H. Wright Thomson showed—(*a*) A case of paralysis of the left sixth and seventh cranial nerves in an infant, æt. 2 years and 10 months. The paralysis was associated with great general weakness. The lesion was believed to be a tumour, probably tuberculous, of the pons, involving the nuclei of the sixth and seventh nerves. (*b*) A case of paralysis of latero-version, with ptosis, occurring in a boy after an acute illness. Apart from the eye symptoms, the boy enjoyed excellent health. Dr. Thomson believed the cause to be an inflammation, dating from the time of the acute illness, of the nuclei of the third, fourth, and sixth nerves. (*c*) A case of congenital ptosis with paralysis of most of the external ocular muscles. The patient was a girl of 19, who was born prematurely, the child of a drunken mother. Examination of the eyes showed that there was little movement of the eyeballs possible, and that, while the angle between them varied slightly, they never approached parallelism, nor could either eye alone be made to look straight forward. Rotatory nystagmus was almost constantly present. The only movement which the right eye was capable of was slight adduction, nearly sufficient to make it look straight forward, and this was accompanied by very marked rotation of the eyeball round its antero-posterior axis, such a rotation as the inferior oblique muscle causes. The right eye, whose position of rest was one of less divergence than that of the left, was capable only of slight abduction, with rotation round the antero-posterior axis caused by the superior oblique. The movement of the right eye was probably the result of a combined action of the internal rectus and inferior oblique, both of which are supplied by the third nerve, while the movement of the left eye resulted from the action of the superior oblique, supplied by the fourth nerve. The condition could only be accounted for by a lesion involving almost the entire orbital nuclear area in the pons, possibly syphilitic in origin.—Dr. J. Crawford Renton read a paper on "The Diagnosis and Surgical Treatment of Acute Appendicitis, with Suggestions towards diminishing its Mortality."

February 19, 1904.—Dr. G. Lindsay Steven showed a case of loss of memory (general amnesia), setting in suddenly about eight weeks before, and possibly of epileptic nature and origin. The patient, a male, æt. 24, was brought to hospital by the police, having been found in the street in an unconscious condition. He was unconscious on admission; the limbs were alternately relaxed and contracted, but there were no distinct clonic convulsions. He soon recovered consciousness, but was unable to give any information whatever about himself. His address was found on a piece of paper in his pocket. His landlady, who was sent for, stated that he was subject to epileptic fits, but that he had not, while living in her house, suffered from loss of memory after any of these attacks. He now has the appearance of a person in ordinary health, and answers questions intelligently. He knows nothing of his history, previous to his admission to hospital, except what his landlady has told him. For the past four weeks he has suffered from excruciating headaches once a week.—Dr. Newman gave an account of three cases of reno-renal reflex pain—cases in which the symptoms pointed to the sound kidney as being the diseased one—(1) There was a history of pain in the left renal region, of five years' duration. The other symptoms pointed to stone in the right kidney. On cystoscopic examination, blood was seen issuing from the right ureter, whose orifice was ragged and swollen. The X-rays revealed a stone in the right kidney. Removal of the stone was followed by complete cessation of symptoms. (2) Pain was confined to the right side. X-rays revealed a stone in the left kidney and none in the right. Cystoscopic examination gave no information. The removal of two stones from the left kidney was followed by relief from the symptoms. (3) Pyonephrosis limited to left kidney. At first there was pain on both sides, but later the pain was limited to the left kidney. The right kidney was felt to be enlarged. No enlargement of the left kidney could be detected. With the aid of the cystoscope, pus was seen issuing from the right ureter. The right kidney was incised and 10 oz. of pus evacuated. There has been no recurrence of pus or pain.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*February* 8, 1904. —The President, Mr. A. E. **MAYLARD**, in the chair.—Dr. **MUNRO KERR** showed a uterus which he had removed on account of malignant disease, complicating a pregnancy of about eight months. The tumour was excised per vaginam, to avoid possibility of septic infection of the peritoneum, the uterine arteries secured, and then Cæsarean section was performed, delivering a living child, and finally the whole uterus was extirpated through the abdominal wound.—Mr. **GRANT ANDREW** showed a large single hydronephrotic kidney, which, during life, gave rise to symptoms simulating those of appendicitis.—Dr. **JOHN ANDERSON** demonstrated naked-eye and microscopical specimens of the prostate gland, extirpated by Dr. R. H. Parry by Freyer's method. In three specimens, which were received entire, a portion of the membranous urethra was present, and right out to the surface of the removed masses prostatic tissue could be recognised.—Dr. **NAPIER** showed a patient suffering from cerebral tubercle who improved greatly after treatment by repeated lumbar puncture, and read notes of other cases treated in a similar way.—Dr. **JOHN ANDERSON** showed microscopical sections of the colon from Dr. Parry's case of fæcal concretion in the ascending colon, reported at the December meeting. The specimens demonstrated the absence of malignant disease.

FORFARSHIRE MEDICAL ASSOCIATION.—*February* 5, 1904.—Dr. A. J. **DUNCAN** in the chair.—Before the ordinary business was taken up, reference was made from the chair to the death, since the last meeting, of a former President, Dr. Samuel Lawrence of Montrose.—Professor **KYNOCH** showed a cast of fœtal head illustrating moulding as the result of a persistent brow presentation. Professor Kynoch also showed a mother and her child after Cæsarean section, and read notes on the case. The operation was performed before the onset of labour for pelvic contraction. The pelvis was of the small, flat, rickety type; its conjugate was estimated to be about 3 in. The patient, who was of weak intelligence, was rendered sterile by ligature and division of the Fallopian tubes. Beyond a rise of temperature to 101° on the second day, the convalescence was absolutely satisfactory. The child was put to the breast on the sixth day, and nursing was continued throughout the period of convalescence.—Mr. GREIG read a paper on the "Surgical Treatment of Empyema." He gave the results of eighty-four consecutive cases of his own, twenty-one of which ended fatally, and sixty-four successfully. The effects of preceding illness and delay in operation on the prognosis was then dealt with. The operation performed, to be successful, must aim at safety, evacuation of the empyema, and the early closing of the cavity. He emphasised the importance of getting rid of the fibrinous exudation at the operation. Portions of ribs removed from fifteen cases were shown. Professor Stalker spoke on the fatality of left-sided over right-sided empyemata, referred to by Mr. Greig, and pointed out the connection between left-sided pleurisy and pericarditis as a probable explanation. He was glad to find that incision as low down as possible was condemned by Mr. Greig. Dr. Halley, while agreeing with Mr. Greig's operation in adults, questioned its routine adoption to the same extent in children. He considered it necessary, for free drainage, to excise portions of two ribs in all cases of empyemata in children, and considered the drainage tube was then quite useful. Mr. Greig said he got his patients out of bed as soon as the dressing of the wound permitted. It was immaterial whether the incision was in the anterior, middle, or post-axillary line, if sufficient room were obtained for evacuation of the fluid, and removal of the amount of ribs required. If it were in the post, the difficulty was that you had to raise the patient round slightly. He usually adopted the incision in mid-axillary line. He agreed that the fluid should be examined microscopically, as pneumococcal empyemata heal undoubtedly quicker than when due to streptococcal infection alone. He would operate on tuberculous patients, if the physician desired it, but would not agree to aspiration. He would rather leave them alone. He had not found any danger from sudden evacuation of the fluid.

OBITUARY.

◆

ROBERT JAMES BLAIR CUNYNGHAME, M.D., F.R.C.S.Ed.

FOR a considerable period Dr. Blair Cunynghame had not been in good health, and his death, although sincerely regretted, was not unexpected. He never recovered from a serious attack of pleurisy some years ago, which led to his visiting the Antipodes, and although he was able to perform his duties thoroughly, it was obvious that his health was weak. More than one family bereavement afflicted him, and no doubt increased his physical troubles, yet he bore sorrow and illness bravely and cheerfully, and struggled on till well nigh the end.

Dr. Blair Cunynghame studied medicine in the University of Edinburgh; he took his M.D. in 1862, and became a Fellow of the Royal College of Surgeons of Edinburgh in 1866. He was in his day one of the House Surgeons of the Royal Infirmary, and a President of the Royal Medical Society, and immediately thereupon he studied on the Continent. Shortly after graduating he entered the Army Medical Service, and was gazetted to the Rifle Brigade. After serving with his regiment for some years, he resigned his commission and settled in practice in Edinburgh, devoting special attention to diseases of the throat;

a department which was then in its infancy. He became also the University Assistant to the late Professor Sanders, and during several long illnesses of that distinguished teacher he undertook all the duties of the chair with great acceptance. Subsequently he became Physician to the Royal Hospital for Sick Children, but on the death of Dr. Robertson, which shortly followed his appointment, he was nominated to the post of Superintendent of Statistics to the Registrar-General. In this office Dr. Blair Cunynghame found his life work, and threw himself with enthusiasm into its duties. This was especially the case in the analysis of the Census Returns, and the report which he issued on the Census of 1901 was a masterly piece of work. Those who are conversant with vital statistics have pointed out that it is in every respect a model of what such a report should be.

Dr. Blair Cunynghame was for some time Secretary of the Royal College of Surgeons, in which office he succeeded his life-long friend, Mr. Joseph Bell. As in all other official positions, he filled this onerous post to the universal satisfaction of the Fellows of the College, and only demitted office in order to undertake the duties of President. In this prominent situation, in the glare of that fierce light which beats upon the chair, he acquitted himself with gracious dignity and unswerving impartiality; in his hands, certainly the Presidentship of the College lost none of its distinction. As proprietor of Cronan, he was one of the lairds of Perthshire, and was on the Commission of the Peace for that county.

The subject of this sketch was one of the most honourable of men, holding lofty ideals of duty, from which he was never known in the slightest degree to swerve. A loyal friend in all conditions, a fearless opponent when occasion demanded, the embodiment of courtesy in every relation, and the soul of generosity in thought and deed,—little wonder that, throughout a wide circle, there is deep sorrow over the void left by his death.

Deputy-Surgeon-General James Leitch, M.D.Edin.

By the death of Dr. Leitch on 13th January, a familiar figure has been removed from Club-land in Edinburgh.

A native of Perthshire, James Leitch (whose father and grandfather were in succession doctors at Logie-Almond, and whose great-grandfather served in the Peninsular War), came from school to the University of Edinburgh ere the close of the third decade of the last century, and passed through the somewhat stormy academic times of that epoch, many old yarns of which he used to spin. Graduating in 1844, and in the same year obtaining the licence of the Royal College of Surgeons, he set himself at once to acquire some practical acquaintance with his profession. But, being attracted to the public services, he entered the medical department of the army in 1846, and was gazetted to the Ross-shire Buffs—the old 78th—now the second battalion of the Seaforth Highlanders, in that year. Thereafter he was for many years engaged in various medical capacities in Her Majesty's service, and finally retired with the rank of Deputy-Surgeon-General.

Throughout his life he was proud of having served under the famous motto, "Cuidich 'n Righ," and lived on terms of friendly intimacy with the few men who were in the regiment during those early years of his life when he wore the Mackenzie tartan. For many years he was a citizen of Edinburgh, and was well beloved by a circle of devoted friends. A man of genial nature and lovable disposition, he brought the charming manner of an old-world courtesy into our modern times.

ROBERT MILNE MURRAY, M.A., M.B., F.R.C.P.Ed.

WE deeply regret the loss which has befallen the medical profession by the death, on 14th February, of Dr. Milne Murray.

Robert Milne Murray was born in 1855 at Fettercairn. His father, a schoolmaster, was a man well known in the district both as a sound teacher and as a man of culture. From him his son received the early education which enabled him, when he went to the University of St. Andrews, to take a high place. Having graduated as Master of Arts in 1875, he went to Edinburgh and commenced the study of medicine. He took his degree with honours in 1879, and was appointed Resident Surgeon at the Maternity Hospital, and Assistant to Dr. Halliday Croom. In this way he became associated with that department of medicine which he was destined to adorn so conspicuously, and was able to develop the wonderful powers of clear exposition and convincing demonstration which made him so successful as a teacher. He was elected a Fellow of the Royal College of Physicians in 1886, in which year he became a Lecturer on Midwifery and Diseases of Women in the Edinburgh School of Medicine. As a lecturer he was singularly successful. He was endowed with a keen sense of humour, and the dullest subject was lit up by him with sudden and unpremeditated flashes of wit.

In the department of midwifery Dr. Milne Murray had reached a position of high eminence. He was a Physician to the Royal Maternity Hospital of Edinburgh, and Examiner in London on Obstetrics to the Indian Medical Service. To the literature of the subject he contributed numerous papers, the majority of which have appeared in this Journal. In the practice of gynæcology Dr. Murray had also established a wide reputation as a writer and operator.

A subject which he had made peculiarly his own was the use and the scope of the midwifery forceps. He reduced the matter to mathematical and mechanical perfection, and the instrument which he devised was capable of doing all that it is possible for forceps to do. The Obstetrical Society of Edinburgh, where most of his papers were first read, honoured him in 1900 by electing him as its President.

While to many Dr. Milne Murray was known as an obstetrician and gynæcologist, to another world he was equally famous as an electrician. In the Royal Scottish Society of Arts, of which in 1892 he became Vice-president, he read numerous papers on subjects bearing upon the applications of electricity, and for these papers he was awarded several prizes, including the Keith Prize and the Makdougall-Brisbane Prize. He not only devised but actually himself constructed much electrical apparatus, and he left a private laboratory containing costly and delicate instruments.

There is scarcely one tie in life stronger than that which binds a teacher and a favourite pupil, if that be as it ought. If the relation is unruffled by even a breath of misunderstanding, the relationship is both paternal and brotherly, and if cemented by mutual respect and oneness of interest in common study, then the co-existence is most delightful, and the separation of death bitter indeed.

Robert Milne Murray was a man whose character was many-sided, and he had a wide interest in every branch of knowledge. In pure science he might have attained to the highest eminence, while in art he was something of an expert, an acknowledged authority on engravings, a very competent judge of painting, with a keen eye for the beauties of architecture, knowing the characteristic features of most of our cathedrals at home and abroad. It was music, however, which engrossed most of his attention in his leisure hours.

Dr. Murray, while admiring all that was beautiful in the old, was a devoted enthusiast (as was natural to one whose mind was ever open to progress everywhere) to the more modern school of Germany, which seemed to open up for him a new world of thought and feeling.

His gentle and kindly nature amid weakness and failing health, his unwearied devotion to duty and perfect consideration for others, his manliness, his simple and unaffected goodness, will long endear him to us who had the happiness of serving with him in school or in hospital, or the privilege of seeing him during his long and painful illness.

Few men, without courting popularity, have commanded such general respect from all classes of the community, and all sections of opinion,—as well from those who knew him by little more than reputation as from those who enjoyed a closer intimacy. Not many men have seemed to understand more practically the obligations of his profession, or to exhibit more persuasively before the eyes of a younger generation all that was most truly honourable and stimulating in the brotherhood of science.

Milne Murray could ill be spared from our medical school. His death has made a vacancy in our midst, which for long it will be hard to fill. We mourn a life untimely cut short, full indeed of attainments, yet fuller still in promise of what might have been in the future, and we lose in him a sample of that disinterestedness and singleness of character which is more important to our common human life than even politics, or art, or science, or literature.

Into the more sacred region of religion it is not for us to enter. Milne Murray's independence and thoroughness were characteristic of him here as elsewhere. He took nothing for granted, laid claim to nothing which he had not truly made his own, and if he passed through the pain of doubt, yet

> "He fought his doubts and gathered strength,
> He would not make his judgment blind;
> He faced the spectres of his mind,
> And laid them.
> Thus he came at length
> . . . . . .
> To find a stronger faith his own."

To her who brightened his life, and whose devotion cheered his long illness, we present our deepest and most respectful sympathy in her loneliness.

EDINBURGH
MEDICAL JOURNAL.

EDITORIAL.

The Position of Poor Law Medical Officers.

A COMPARISON of Scottish with English law brings out a vast superiority of the former in almost every branch. Based as it is on the ancient Roman law, it is, in form and substance, *totus, teres, atque rotundus,* much unlike the thing of shreds and patches, the fortuitous combination of use and wont, of equity and precedent, which calls itself English law. But there are exceptions to this rule, or at least, so far as we mediciners are concerned, there is one exception, and it is a big one. Whilst our Medical Acts and our Anatomy Acts are the same as those of England, we have a better Public Health Act, and our medico-legal procedure is on the whole superior to that of the predominant partner. The exception emerges when we consider the medical administration of the respective Poor Laws. That of England appears to work smoothly so far as the bulk of Poor Law medical officers are concerned; that of Scotland is a standing grievance, and is worked in some districts in a way that is a distinct insult to the medical profession.

Curiously enough, it was not always so. The Scottish Poor Law, in its inception, was well and truly drawn in the interests alike of the poor and of those in medical charge over them. It is not till within a quite recent period—till 1894, to be exact—that the change came about which was to work so disadvantageously for this section of the profession. At that time, with the formation of the Parish Councils, under the Act of that name, a change came about in the *personnel* of the governing boards, in respect of the elimination of the nominated members. These being usually men of education, with some breadth of view, were able to sway matters so, that a reasonably wide purview was obtainable of the questions submitted to them. In the large cities, and in urban districts generally, this is still obtained, and in them there is practically no grievance. It is when one considers what is being done in the far corners of civilisation, in the outlying districts, particularly in the Highlands and Islands of Scotland, that troubles become manifest. Here Hodge, or his Highland equivalent, reigns supreme and unchecked. The law does not allow him to interfere with the medical officer, either as regards his salary or as regards his duties. But what cares MacHodge, when the lust of power is on him. He cannot *order* the medical officer to attend a person who is not on the roll of paupers. But he can and does *request* him to do so, and if the luckless medico objects, and seeks the protection of the Local Government Board, MacHodge requests him to beware of the next statutory meeting, when his appointment will come up for revision. This is tantamount to a threat of dismissal, with the loss of the appointment and of the wretched little practice as well; the medical officer succumbs to *force majeure*, and MacHodge is greasily triumphant.

But this is only one of the ways in which the medical officer's life is made a burden to him. His salary does not legally cover the undertaking of extra work, such as the onerous and responsible act of judgment involved in the granting of certificates in lunacy. For this he is entitled, and justly entitled, to extra fees. It may be that these are compounded for by an annual increase in salary, and this is reasonable so far as the lunatics chargeable to that parish are concerned. But what of casual certificates, for lunatics chargeable to other parishes? For these the medical officer is entitled to look for payment from the parish to which the patients are chargeable. He has done extra work for a body which does not pay him any regular salary, and it is mere justice that the fee which he has earned, he should receive. Will it be believed that there are parish councils which defraud him of this hard-earned sum? Some add insult to injury, by generously giving him one-half; others, of the "whole hog" persuasion, give him none, and place it in their own pockets as ratepayers. Then again there is the question of extra remuneration for extra and special work. In England such work is relatively well paid. A medical officer in England may get £5 for a bad compound fracture. In Scotland he has to take it in the day's work. Midwifery, too, he is expected to do for nothing. Obstetric practice, under the most favourable circumstances, is a sore burden both to mind and body. What it may be when practised in the dwellings of the very poor is only known to those who "have been there." Like the battle of the warrior named in Scripture, it is "of confused noise and shouting, and of garments rolled in blood," plus dirt and filth of every description, with the reek of raw whisky over all. And the unfortunate medical man who has accepted a Poor Law appointment in Scotland has to endure all this additional misery without any equivalent in fee to make up at least for the inevitable loss of time.

These grievances would appear to constitute a sufficient indictment against the present state of things. One would not expect .to find that, in addition to these, there is a systematic method of sweating the Poor Law medical officer even in his private practice. But such, one is almost ashamed to say, is the case. Will it be believed that there are parish councils so high-handed in their despotic misuse of the powers entrusted to them, as to dictate to the medical officer what fees he shall charge to his private patients? Not only so, but we believe that instances are not wanting where parish councils go so far as to combine their whole district into a kind of "medical aid" society, and to compel the luckless individual who is under their tyranny to attend whole families at a uniform rate of three shillings per annum per household! Is it that some medical men are born invertebrate? or, otherwise, how can these things be? In comparison with these larger and more revolting instances of parochial tyranny, other grievances within our knowledge are of less account, such as the difficulty of getting any reasonably decent house accommodation, and the impossibility of finding, out of his meagre pittance of a salary, the wherewithal to get a *locum tenens* and a much-needed holiday.

But, taking these things as proven, no reasonable man can doubt that the Poor Law medical officer in Scotland is subject, in many places, to a sweating system which is a disgrace to communities which permit it, and a scathing indictment of our boasted powers of local self-government. It is a condition which the working men of no skilled trade in the kingdom would endure for a moment. The only question for us to consider is, how such a system may best and most effectively be swept into limbo?

There would appear to be several possibilities. It might be that the men in the affected districts might combine and strike against the iniquitous condition of things. But "the conies are a feeble folk," small in actual numbers, scattered sparsely over a wide area. A small combination, such as theirs would be, could never hold together in face of the resistance they would meet. A general combination of the Poor Law medical officers of Scotland might do something, and such a body is already in existence, and is doing what it can. Its headquarters are in Glasgow, and it is officered mainly, if not entirely, by Poor Law medical officers of that city. It meets, moreover, once a year in Glasgow for its deliberations. This might very well become the nucleus of a much more widely extended organisation. Are there no Poor Law medical officers of standing elsewhere than in Glasgow? What of Inverness and Aberdeen, of Dundee and Perth, nay, if we might dare to say so, of Edinburgh and the other smaller towns of Scotland? The addition of some of these to the official list might add somewhat to its weight. We are inclined to think, moreover, that the position taken up by that body with reference to the recent burning question of unqualified dispensers in "doctors' shops" did not add greatly to its prestige. Still, with some reforms on these lines, it might be made to serve a useful purpose in this reform.

Then what of the General Medical Council itself? This is surely a question with which that serene body might care to concern itself without loss of dignity. But it is now many years since the President of the Council, speaking *ex cathedrâ*, declared that the Council was created "in the interests of the public, to secure for that public competent professional aid." That the profession itself might have also some legitimate "interests" did not seem of much importance. Fortunately there is now a much more powerful agency, by whose aid we confidently expect that help may yet come to the Poor Law medical officers of Scotland. The British Medical Association, by one or other of its Committees, should possess, and will doubtless exercise, the needful influence when the proper time arrives, and when the facts are before it. We would suggest that, in the first instance, the newly formed Scottish Committee be asked to take the matter seriously in hand. It would put it into fitting shape, and approach the Parliamentary Bills Committee, with the view of having a short Bill introduced to Parliament. The pivot upon which the whole agitation should turn should be security of tenure. Without that, nothing will avail against MacHodge. With it, he will be impotent for serious mischief. Then the English terms for extra payment should be insisted upon, and the Irish precedent quoted as to holiday allowances. Were these reforms carried, life would be once more bearable as a Poor Law medical officer. Meantime he is the victim of a system as pernicious, as tyrannous, and as humiliating, as is to be found anywhere outside the dominions of the Turk.

Practical Midwifery in Edinburgh.

THE practical teaching of Obstetrics in the Edinburgh Medical School has not hitherto kept pace with the progress of the sister subjects, Medicine and Surgery. The arrangements for practical tuition have been, to say the least of them, fortuitous, if not chaotic, and those in authority have apparently acted on the principle of *laissez faire.* The Commission appointed two or three years ago by the Representative Council, discovered the startling fact that a very large number of undergraduates attend 250 lectures upon Midwifery. It cannot be said, therefore, that the medical student in this school neglects systematic instruction. With such an excessive amount of didactic education, there has, nevertheless, been little attempt to systematise the possibilities of practical education; in fact, it may be said in simple truth, that theoretic instruction and practical tuition have been, as far as Edinburgh is concerned, in an inverse proportion to each other.

A new epoch appears now to be dawning, and it is to be hoped that before long the practical training in Obstetrics will be brought abreast of that in Medicine and Surgery. This result will be due to the energy of certain of the younger teachers in the Medical School. In consequence, we understand, of a suggestion thrown out by Dr. Haultain to a director of the Town and Gown Association, steps have been taken to remedy the present state of matters. Three houses have been acquired next to the Royal Maternity Hospital, and these are being fitted up so as to form one of the University Halls for the reception of medical students. Every arrangement which can minister to the convenience of the residents is being carefully thought out. The close contiguity of the Hall to the Hospital, the easy access which is being provided, and the means of summoning the residents at a moment's notice—these and all other possible means of rendering the system complete are receiving due attention. It is intended to render the whole system as thorough as in any other centre of Obstetric instruction.

It seems to us that if the Directors of the Royal Maternity Hospital and the Managers or other Committees that preside over the various Dispensaries throughout the city, were to consult upon this important subject, they might confer an inestimable boon upon the Medical School. The present departure promises to be the first advance for many years, but it leaves a great deal yet to be done. System is what is wanted. If the number of extern obstetric physicians to the Royal Maternity Hospital were increased by the inclusion upon its staff of the accoucheurs of the dispensaries, it might be easy to form one large teaching institution for Edinburgh. We consider it our duty to throw out this suggestion, in the hope that it may arouse a response in the minds of those who are concerned with the management of the various institutions referred to, as we are assured that some steps in this direction are absolutely necessary for the future welfare of the Edinburgh Medical School.

The Hunterian Lectures.

THE Hunterian Lectures on "The Evolution and Action of Certain Muscular Structures of the Heart," recently delivered by Dr. Arthur Keith, are of more than passing interest, especially perhaps to Edinburgh graduates, in view of the important Morison Lectures delivered last year on an allied subject by Dr. G. A. Gibson. Dr. Keith, as an eminent anatomist and morphologist, has naturally approached the subject from that point of view which more directly interests him, whilst the Morison Lecturer equally naturally dealt in a particularly lucid and able manner with the clinical side of the question. The Hunterian Lectures of 1904 form therefore a fitting sequel to the Morison Lectures of 1903.

Dr. Keith's first point is a particularly good one. He holds that a correct interpretation of the facts presented by the sciences of embryology and morphology is indispensable for the elucidation of many of the clinical phenomena presented in cardiac disease, an opinion with which we find ourselves in agreement, as we have never seen any reason for studying embryology as a science, apart from its practical application.

Holding this view, Dr. Keith endeavours to answer certain important clinical queries by applying to their elucidation the facts recorded by him in his embryological investigations; thus, dealing with the subject of venous pulsation in the neck in the later stages of heart disease, he naturally asks himself the question, "How are the caval orifices normally closed during auricular systole?"—a question of obvious importance to the clinician, the physiologist, and the anatomist. Dr. Keith shows that the current explanation that the caval orifices are closed by the contraction of muscular fibres surrounding them, breaks down directly these orifices are examined anatomically, for the simple reason that no annular muscular fibres are present, or are, at all events, so rudimentary as to be inappreciable.

Having upset current views, Dr. Keith, by references to comparative anatomy and to certain ingenious experiments performed by himself, endeavours to prove that the superior vena cava is closed, or is at all events reduced to a fissure by the tænia or crista terminalis and by a muscular band crossing the atrium posteriorly, and that the inferior vena cava is closed during auricular systole by being drawn upwards towards the inter-auricular septum, and by the bulging of that septum towards the cavity of the right auricle. He concludes by noting the significant facts that in hearts taken post-mortem from cases of observed venous pulsation during life, the crista terminalis was markedly enlarged, and that the inter-auricular septum was greatly extended. It is also not without clinical interest to note that, according to Keith, the superior vena caval orifice is the least likely to allow regurgitation in auricular systole.

Another important part of Keith's work is that which deals with the question of the method of fixation of the heart in the thorax. As is well known, Keith has latterly devoted much study to the effects of diaphragmatic contraction upon adjacent viscera, and, needless to say, his remarks are here peculiarly interesting, particularly so when he states that "the movements of the heart seen in the open thorax are not those which take place naturally"—nor, we might add, is the shape of the formalin-hardened heart described by anatomists that of the human heart during life.

Apart from the points already mentioned, there are many other interesting questions raised by the lecturer, amongst these being the question of the mechanism of the fœtal right auricle, the method of closure of the pulmonary veins, the fixation in position of the apex of the heart, and so forth; and although we have merely indicated some of the more striking and possibly more controversial points in Keith's work, the lectures are well worthy of being read through in their entirety, as, though the reader may not agree with all Keith's conclusions, he will at all events be furnished with food for thought and observation, and very likely, if of a scientific turn of mind, with subject for research.

The Carnegie Trust.

THE Report of the Administration of the Carnegie Trust, for the year 1903, has now been submitted by the Executive Committee. It contains a number of points of interest, to one or two of which we may briefly refer. With regard to the endowment of Post-Graduate Study and Research, we find that 156 applications were received. Of this number, the claims of seventy were favourably considered, appointments being made to five Fellowships and to fifteen Scholarships, while grants of varying amounts were apportioned to fifty applicants. The estimated outlay in this department, for the academic year 1903–4, is £3524. The claims of candidates petitioning for funds for the purpose of research were scrutinised with the greatest care: no one was awarded a Fellowship without submitting evidence, not only of ability, but of having already carried out and published research. In the selection of scholars, preference was given to those who could show evidence of experience and training in methods of work. Careful consideration was also given to the programme of study submitted by the candidate, preference being given to that in which a clearly defined subject of investigation was put forward. We entirely concur with the Committee in thus dealing rigorously with the claims of those applying for the Fellowship and Scholarship grants. Much valuable material and money may be wasted by men who are ignorant of the very rudiments of laboratory methods, and who have really not made up their minds regarding the scope and aim of their work. On the other hand, we would be in favour of the allotment of small sums to individuals anxious to learn technique, and whose financial resources do not permit them to obtain this knowledge without pecuniary assistance.

In connection with the payment of class fees, we find that steps have been taken to place some check upon indiscriminate claims. The standard of the Medical Preliminary Examination is at present lower than that of the preliminary examinations in Arts and Science. The Committee, therefore, have resolved that a student of medicine, in order to become eligible for the benefits of the Trust, shall have passed the Arts or Science Preliminary Examination, or have obtained the leaving certificate of the Scottish Education Department, satisfying in either case the requirements of the Medical Preliminary Examination; as an alternative, that he shall, after passing the Medical Preliminary Examination, have completed a qualifying curriculum of study in the four subjects of the First Professional, and have passed in two of these subjects. The number of beneficiaries for the winter session 1903–4 is 3027, an increase of 160 over the previous winter session. This represents a sum of £30,510, or the fees of 8976 class attendances.

The Last "K. C."

It was a happy thought that inspired the promoters of the function which recently took place in the great kitchen of the Old Royal Infirmary. To the present-day student the existence of such a place may have been somewhat of a myth, so far removed is it from his sphere of activity. But the clock of time moved back a bit, and the thing that had been became once more the thing that is—a little more elaborated, perhaps, from the simple function of those primeval times of forty years ago, in which the "Kitchen Concert" was first conceived. But the essentials were there, then and now—the *bonhomie*, the gay comradeship, the casting off of his own particular bit of work, alike for student and examiner, of practitioner and specialist, in order to take part in a jovial and memorable reunion. Men had come up from all parts of Scotland, the Chairman himself from Liverpool—and an excellent chairman Sir William Mitchell Banks proved himself to be; his reply to the toast of his health was worthy of himself and of the occasion. The singing was excellent, and the tableaux, which the present residents supplied, were well arranged, artistically grouped, and comic, without trenching too far on the domain of the burlesque. The showman, too, did his part, with the air grandiloquent that exactly fitted the mood of the moment. That the Staff itself can unbend was shown in the production of an excellent novelty in shape of a Scotch Toy Symphony, under the genial baton of Dr. James. We had hoped for Romberg, for the sake of olden days, but the Scotch airs lent themselves wonderfully to treatment by the nursery instruments. Dr. Gulland's "Dream" moved us, as much by the pathos of the concluding verse as by the sly humour pervading the rest. But to particularise is to become invidious. Enough to say that the whole function was an absolute success, and that it reflects lustre on the talent of the Secretary, Dr. Claude Ker, the moving spirit of the Residents' Club, to whose initiative we believe the whole function was due.

ORIGINAL COMMUNICATIONS.

BENNETT'S FRACTURE OF THE BASE OF THE METACARPAL BONE OF THE THUMB.[1]

By ALEXANDER MILES, F.R.C.S.Edin., *Assistant Surgeon, Royal Infirmary, Edinburgh; Surgeon to Leith Hospital;* and J. W. STRUTHERS, F.R.C.S.Edin., *Assistant Surgeon, Leith Hospital.*

(PLATES VII.-VIII.)

IN 1881, Prof. E. H. Bennett of Dublin first directed attention to the fact that fracture through the base of the metacarpal bone of the thumb is a common injury. He maintained that this fracture is the most common simple fracture of the metacarpus; that it may be readily recognised clinically, but is constantly overlooked, greatly to the disfigurement and damage of those who sustain it. In support of his contentions, he exhibited six specimens of united fracture of the bone from the Museum of Trinity College, Dublin, and referred to several clinical cases of the injury he had himself observed. In 1900, Beatson reported a case of this injury which he had observed clinically, and Prichard recorded the occurrence of the accident to himself.

No other cases, so far as we can find, have been put on record; and although Bennett's cases have been quoted by others, his claims as to the frequency and importance of the fracture are not generally admitted. Ricard and Demoulin, in Duplay and Reclus' "Traité de Chirurgie," in estimating the relative frequency of fracture of the metacarpal bones, quote the statistics of Malgaigne and Polaillon, and conclude from them: (1) That fractures of the metacarpal bones form 1 per cent. of all fractures; and (2) that of the five metacarpal bones, the first and fifth are least frequently, and the third and fourth most frequently, broken. They refer briefly to Bennett's record, but ignore his statements as to the relative frequency of the injury; and seem rather to regard his cases as exceptional. Stimson treats the subject in a similar manner. Hoffa describes the injury as "*besonders typisch,*" and reproduces Bennett's illustration of a typical specimen, but does not apparently regard the injury as a common one. In the last edition of the "Handbuch der Praktischen Chirurgie," the writers mention Bennett's fracture merely to say that it cannot be numbered among common injuries. In the article on "Fractures" in the *Encyclopœdia Medica*, Bennett's illustration is reproduced as a "fracture of the stave of the thumb," and the injury is incorrectly said to be caused by a fall on the palm of the hand. Scudder, in his "Treatment of Fractures," gives a tracing of a radiogram of a "fracture of the upper end of the metacarpal bone of the thumb," but makes no reference to this injury in the text. We have not been able to find any reference to Bennett's work in English text-books on Surgery.

---

[1] Paper read before the Edinburgh Medico-Chirurgical Society, December 1903.

The observation of a number of cases of the injury has convinced us that Bennett's claims are well founded, and we put our experience on record, in the hope that it may help to draw attention to this injury and to gain for it a more general recognition than it has hitherto received.

In his first and subsequent communications, Bennett described six museum specimens of the fracture, and referred to eight clinical cases which he had observed.

With the two cases reported respectively by Beatson and Prichard, the total number of recorded cases (including museum specimens), as far as we are aware, amounts to sixteen.

Since 1900 we have seen fifteen clinical cases of Bennett's fracture, notes of which we subjoin, and have been able to find two specimens of undoubted old-standing cases of the injury (Plate VII. Figs. 2 and 3), and two specimens showing changes probably due to Bennett's fracture followed by osteo-arthritis in the affected joint (Plate VII. Figs. 5 and 6).

Our cases are as follows:—

Case 1.—Robert B., æt. 38, policeman. Four weeks before applying for treatment, the patient struck the tip of his right thumb violently against a wall, while struggling with a prisoner. The blow caused severe pain in the thumb, and after the injury marked swelling appeared at the base posteriorly. The patient was unable to use the thumb after the accident owing to the severe pain which any attempt at movement caused. At first he regarded the injury as a trivial one, but as he found that pain and weakness persisted, so that he was unable to use his right hand, he consulted Dr. Wm. Paterson, who kindly referred him to us. On examination, it was seen that there was still considerable swelling over the base of the metacarpal bone of the thumb posteriorly. The range and strength of the movements at the carpo-metacarpal joint were much impaired. The patient could not abduct the thumb fully. He could oppose the thumb to the index finger, but the strength of the movement was very feeble, and he was unable to oppose the thumb to the little finger. The power of his grasp in the right hand was consequently very weak, and the attempt to grasp firmly caused pain at the carpo-metacarpal joint of the thumb. On palpation, the swelling was found to be largely due to abnormal prominence of the base of the first metacarpal bone, which was found to be displaced upwards and backwards, being thus partially dislocated on to the dorsal aspect of the trapezium. This displacement could be partially reduced, by extending and abducting the thumb while pressing the base of the metacarpal towards the palm, and the reduction was accompanied by marked crepitus. When the extension and pressure were relaxed, the displacement was reproduced. The small palmar fragment of the metacarpal bone could not be distinctly felt among the muscles of the ball of the thumb.

A *diagnosis* was made of fracture through the base of the metacarpal bone of the thumb, with partial luxation of the main part of the bone upwards and backwards.

Treatment.—The displacement was reduced, and the thumb fixed in the reduced position by a splint applied so as to keep up extension and abduction. At the end of a week the splint was removed, and massage and passive movement were carried out till the patient was able to move the thumb freely. Five weeks after treatment was begun, the patient had regained the use of his thumb almost completely, and was able to resume work. On 28th November 1903, two years and a half after the accident, he again reported himself. Slight abnormal prominence of the base of the metacarpal still remained, but the movements of the thumb were of good range and strength, and the patient stated that he felt no practical inconvenience from his injury. The grasp of the right hand, however, was slightly weaker than that of the left, and the stretch of the hand not quite so wide.

In its history, clinical features, and progress, the above case is a typical one. The succeeding cases will be more briefly described, any particular in which they differed from the usual type of the injury being specially noted.

Case 2.—Patrick Q., æt. 42, sailor. Four weeks before applying for treatment, the patient, in falling from a height of 6 feet on to the deck of a ship, put out his hand to save himself, and struck his thumb violently against the deck. On examination, all the characteristic signs of Bennett's fracture were present. The displacement was very marked. Complete reduction of the displacement was impossible, but crepitus was marked when the metacarpal was moved on the trapezium. A radiogram was taken, and the diagnosis confirmed. The patient was in this case recommended to practise moving the thumb regularly, and to massage the region of the carpo-metacarpal joint, from the first. Fixation was considered unnecessary, as very little reduction of the displacement could be effected. The patient gradually regained the power of the thumb. Two and a half months after he was first seen, he reported himself, saying that he had been able for his work as a seaman for some weeks, and felt no inconvenience from the injury. The displacement was as marked as before. Crepitus was no longer present. A second radiogram showed slight callus formation on the palmar aspect of the base of the metacarpal, uniting the fragments. The grasp of the right hand seemed slightly weaker than that of the left.

Case 3.—Richard S., æt. 60, engine-fitter. Twenty days before applying for treatment, the patient was knocked over while walking along the street. He put out his hands to save himself, and "staved" his left thumb against the ground. He came for treatment on account of continued pain and weakness in the thumb. On examination, all the characteristic signs of Bennett's fracture were present. A radiogram confirmed the diagnosis. The treatment consisted of fixation of the thumb for two weeks, followed by massage and movement. The patient returned to work a few days after the splint was removed. He reported himself four months after the accident, saying that he felt an occasional twinge of pain when he grasped firmly with the thumb fully abducted, but that otherwise he had no inconvenience from the injury. Some displacement of the metacarpal was still present, but the function of the thumb was fully restored. Some grating could be felt on moving the metacarpal on the trapezium. A second radiogram showed distinct callus formation uniting the fragments.

Case 4.—George C., æt. 54, labourer. Three weeks before applying for treatment, the patient fell and "staved" his left thumb against the ground. On examination, all the signs of Bennett's fracture were present except crepitus. A radiogram (Plate VIII.) was taken, which confirmed the diagnosis. Treatment was carried out as in Case 3, and the patient was able to resume work a week after the splint was removed. He reported himself four months later, saying that he had no inconvenience except a feeling of soreness in the thumb after a long day's work with a shovel. Some displacement was still present, and slight grating could be felt on moving the injured joint. A second radiogram showed marked callus formation uniting the fragments at the base of the thumb.

Case 5.—Peter H., æt. 48, labourer. The day before applying for treatment, the patient fell to the ground from a height of 8 feet. He put out his hand to save himself, struck the tip of his thumb on the ground, and hurt his thumb severely. On examination, there were found swelling and ecchymosis along the shaft of the metacarpal bone of the right thumb posteriorly. The patient could only move the metacarpal on the trapezium very slightly, and attempts at movement caused pain. The base of the metacarpal projected backwards, but not so markedly as in most cases of Bennett's fracture. In reducing the displacement, crepitus was not felt, but on moving the metacarpal about freely, occasional grating could be recognised. The case was regarded as one of Bennett's fracture with unusually little displacement. A radiogram showed, however, that the fracture was an atypical one, inasmuch as the palmar fragment had carried a long splinter from the front of the shaft of the bone with it, and the main or dorsal portion of the shaft had also given way just beyond the base of the bone. The thumb was fixed in the fully abducted position for three weeks, and the patient was instructed to practise movement regularly thereafter. When last seen he had regained the power of his thumb almost completely.

Case 6.—Mrs. M., æt. 53. Eight days before applying for treatment, the patient fell going downstairs, and struck her left thumb against the edge of a step. She thought she had "staved" her thumb. Continued pain and weakness caused her to apply for treatment. On examination, pain, swelling, deformity, and crepitus were present as usual. The power of abduction was especially weak. The thumb was fixed in the reduced position for two weeks, and massage and movement employed afterwards.

Case 7.—William P., æt. 22, dock-porter. The patient was struck on the point of the left thumb by a falling sack of sugar, which he tried to hold up. A few days later he applied for treatment on account of pain and weakness in the thumb. On examination, pain and limitation of movement at the carpo-metacarpal joint of the thumb were present. The characteristic deformity was also present, but was less marked than usual. The deformity was reducible, and the reduction was accompanied by crepitus. Treatment was carried out as in the preceding case.

Case 8.—James C., æt. 48, sailor. Three days before applying for treatment, the patient struck a man violently on the head with his closed fist, and hurt his right thumb. Pain and weakness in the thumb remained, and caused him to seek advice. On examination, pain, limitation of movement, and characteristic deformity were present. The deformity was reducible with crepitus. Treatment as in preceding cases.

Case 9.—John L., æt. 19, labourer. Two days before applying for treatment, the patient struck a man with his closed fist, and hurt his right thumb. Pain and weakness in the thumb caused him to apply for advice. On examination, pain, limitation of movement, and characteristic deformity were present. On reducing the displacement, marked crepitus was felt. Treatment as in preceding cases.

Case 10.—Agnes L., æt. 19. Eight weeks before applying for treatment, the patient was thrown out of a cart and struck the point of the left thumb against the ground in her fall. The thumb was painful, swollen, and stiff after the accident. The swelling and pain subsided in a fortnight, but the stiffness and weakness in the thumb remained till she came to hospital. On examination, marked limitation of the range and strength of the thumb movements were present, along with characteristic deformity. The deformity was irreducible, and no crepitus could be felt. The hand was examined by the fluorescent screen, and the diagnosis of Bennett's fracture was confirmed.

Case 11.—Andrew D., æt. 46, carpenter. A few days before applying for treatment, the patient was walking along in the dark, and in putting out his hand to grasp a door-handle struck the point of the left thumb violently against the door. On examination, all the characteristic signs and symptoms of Bennett's fracture were present. Treatment was carried out as before. The result was satisfactory.

Case 12.—A. S., æt. 38, dock-porter. Twelve days before applying for treatment, the patient, while helping to carry a beam of wood, fell and struck his thumb against the beam in his fall. The thumb remained painful and stiff, and caused him to seek advice. On examination, all the signs of Bennett's fracture were present.

Case 13.—J. S., æt. 42, labourer. The patient applied for treatment on account of weakness of the thumb, due to an old-standing injury, the result of a fall some months before he came for treatment. On examination, characteristic prominence of the base of the first right metacarpal was present. There was also marked weakness of grasping power in the hand. A radiogram (Plate VII.) showed a united fracture through the base of the metacarpal bone, with marked callus formation on the palmar aspect of the shaft towards the base, and partial luxation of the metacarpal upwards and backwards.

Case 14.—The notes of this case are incomplete. The patient was an adult male, who came for advice on account of persisting deformity and slight disability of the thumb some weeks after a fall, in which he had injured his thumb. His thumb showed the deformity characteristic of Bennett's fracture, and a radiogram confirmed the diagnosis.

Case 15.—R. D., æt. 60, labourer. The patient was under treatment in a medical ward for advanced cardiac disease. His left thumb was noticed to present the deformity characteristic of an old-standing Bennett's fracture in a very marked degree. He stated that many years before he had "staved" his thumb, and that the deformity had persisted ever since. He suffered no practical inconvenience from the injury. On post-mortem examination, it was found that the condition was one of ununited Bennett's fracture. The base of the main portion of the metacarpal was lying on the dorsal aspect of the trapezium, to which it had become adherent by strong fibrous adhesions, while the short palmar fragment was lying embedded in fibrous tissue and adherent to the trapezium, where the articular surface for the metacarpal joins the dorsal aspect of the bone. The case was one, therefore, in which the displacement was unusually marked, and in which the two fragments had been so far separated that union did not take place.

Morbid anatomy and mechanism of the fracture.—Bennett originally defined the fracture as one "passing obliquely through the base of the bone, detaching the greater part of the articular facette, with that piece of the bone supporting it which projects into the palm."

The fracture might be more fully described as a chipping off of the palmar projection of the base of the metacarpal bone of the thumb, with a varying amount of upward and backward displacement of the rest of the bone, the short palmar fragment retaining its normal relation to the trapezium. In Fig. 1, Plate VII., which represents a normal metacarpal bone, this projection is well seen. It will be noticed that it carries a large part of the articular surface for the trapezium, and that the articular surface is concave from before backwards. . This concavity fits on to the convexity of the trapezium. When a force is applied in the long-axis of the metacarpal bone, it tends to drive the main body of the bone off the trapezium on to its dorsal aspect, and the bone is only maintained in position by the basal palmar projection. When the force is sufficient to fracture the bone, this projection is chipped off, and the remainder of the bone is driven more or less on to the dorsal aspect of the trapezium.

The line of fracture will vary, according as the metacarpal is flexed or extended on the trapezium. In full flexion, the summit of the convexity of the trapezium rests more towards the dorsal margin of the articular surface of the metacarpal, than in full extension, when it rests more towards the palmar margin. It would be expected, therefore, that the line of fracture would be nearer the dorsal aspect of the bone when the accident happens with the metacarpal flexed, and nearer the palmar aspect when the accident happens with the metacarpal extended. In other words, the more the metacarpal is extended, when the force is applied, the smaller will be the fragment chipped off from its base.

In Bennett's figure of a specimen of the united fracture, the line of fracture passes through the middle of the articular surface, and emerges on the palmar aspect of the shaft about one-third of the length of the bone from its base. In Case 5 of our series, the line of fracture passes out on the palmar aspect of the bone near its distal end. In four radiograms of other cases in our series, as also in Beatson's and Prichard's cases, the palmar fragment is seen to be much smaller, the line of fracture passing out on the palmar aspect of the bone well within a third of its length from the base.

This variation in the line of fracture is easily accounted for on the view put forward above.

In Fig. 4, Plate VII., which is an outline drawing of a vertical sagittal section through a normal trapezium and first metacarpal, the varying lines along which the fracture may take place are indicated. The line ending at *d* is that along which the bone was split in Case 5 of our series; the lines ending at *a*, *b*, and *c* represent the more usual lines of fracture, as illustrated by Bennett's figure, by the radiograms of Beatson's and Prichard's cases, and by the radiograms of our own cases. Figs. 2 and 3 are from photographs of first metacarpal bones, illustrating cases of united Bennett's fracture, where the displacement of the metacarpal bone has been permanent. When, as frequently happens, a patient who has sustained the injury does not come for treatment till several weeks after the accident, the palmar fragment may unite with the shaft in the unreduced position, that is more towards the distal end of the metacarpal than it should. In consequence of this, the direction of the articular surface for the trapezium is changed, and it comes to look more towards the palm than in a normal bone. This is well seen in Figs. 2 and 3. In addition, a well-marked transverse groove often remains on the articular surface, indicating the old line of fracture. This is well seen in Bennett's original drawing, and in Fig. 3. The bone in Fig. 2 also shows plainly a line indicating the line of union between the palmar fragment and the rest of the bone. Figs. 5 and 6 are bones which show changes probably due to the chipping off of a small portion of the basal palmar projection of the metacarpal, and its union with osteo-arthritic changes of the bones of the carpo-metacarpal joint of the thumb. In both bones the proximal articular surface looks more towards the palm than in a normal bone, indicating a slight backward displacement of the base of the metacarpal. The occurrence of osteo-arthritis in the carpo-metacarpal joint after the injury is mentioned by Bennett, who says that certain of his specimens of united fracture of the metacarpal show few changes except those due to osteo-arthritis following the fracture.

Etiology.—As is clearly brought out in the histories of the cases recorded above, the fracture is caused by indirect violence, being the result of a blow on the tip of the outstretched thumb, or on the end of the first phalanx when the terminal phalanx is flexed. In the majority of the previously recorded cases, as in most of our own series, the usual history has been that the patient fell, and that in putting out a hand to save himself, he struck his thumb violently against the ground. Many of the patients were unable to describe exactly how the thumb was held at the time of the fall, and exactly how it was struck; but five of our patients stated definitely that they struck the tip of the thumb. In the other cases it was not possible to make out clearly how the thumb had been struck. In two of our cases, and in one case recorded by Bennett, the fracture was caused by the patient striking a violent blow, and in these cases the impact was probably against the end of the first phalanx, the fist being closed, and the terminal phalanx of the thumb flexed.

The accidents which cause the fracture are of everyday occurrence, a fact which our own and the other recorded cases clearly show. Many of our patients, when asked how they had been injured, said that they had fallen and "staved" the thumb. The word "stave" is often applied in Scotland to a contusion or sprain of a joint; but it is important to note that a stave of the thumb frequently causes a fracture through the base of the metacarpal. All so-called staves, therefore, should be carefully examined to exclude the possibility of fracture.

Clinical features.—In his first communication, Bennett laid stress on the fact that all the specimens and cases of the fracture he had met with were of the right thumb. Subsequent experience showed him, however, that the fracture occurred on the left side as well as on the right. In our own series, seven of the cases were on the left side, so that, although the right thumb seems to be rather more frequently affected than the left, the fracture may occur on either side. The ages of our patients varied from 19 to 60, the average being about 40. Two of them were women, the rest men.

In many cases the patients at first regarded the injury as a trivial one, and did not apply for treatment till the continued pain and weakness in the injured thumb made it clear to them that they were not merely suffering from a sprain.

It is interesting to note that even in cases which do not come under observation till two, three, or four weeks after being injured, crepitus may still be present. We have only once been unable to detect crepitus in cases seen within four weeks of being injured. In this case the radiogram (Fig. 7, Plate VII.) confirmed the diagnosis of Bennett's fracture. The signs and symptoms are very constant and not difficult to recognise. The limitation of the range of movement is very marked, the patient being usually unable to oppose the thumb and little finger, and being able to oppose the thumb and index only very feebly. Abduction of the injured thumb is also very limited. In recent cases, any attempts at movement cause pain, and in untreated old-standing cases, attempts to abduct strongly and to grasp firmly may also be attended with some pain.

The displacement of the main portion of the metacarpal bone towards the dorsal aspect of the trapezium produces a marked abnormal prominence which partly fills up the hollow between the long and short extensor tendons of the thumb. This prominence is very easily felt, and in many cases remains as permanent evidence of the fracture.

There is usually no difficulty in distinguishing the injury from a dislocation of the metacarpal backwards, the only injury with which it is liable to be confused. The facts that the deformity can be reduced, that the reduction is accompanied by crepitus, and that the displacement returns when the reducing force is removed, all serve to distinguish the fracture from a dislocation.

Many authors have described a partial dislocation backwards of the base of the metacarpal bone. Polaillon tabulated eleven recorded cases of the injury, and Hamilton figures a hand showing the deformity resulting from a supposed partial dislocation of the metacarpal, the displacement having remained permanent. As Bennett says, "When we bear in mind the form of the articulation in question, it is difficult to conceive the idea of a partial dislocation occurring in it and remaining as a permanent deformity." Such cases may well have been cases of Bennett's fracture, the true nature of which escaped detection. A reference to Polaillon's cases shows that a tendency to the return of the displacement was present in many of them after reduction, a fact which is strong evidence that they were not merely cases of partial dislocation, for when the form of the carpo-metacarpal joint of the thumb is taken into consideration, it seems clear that a dislocation once reduced would show no tendency to return.

We are inclined, with Bennett, to doubt the possibility of a partial backward dislocation of the base of the first metacarpal remaining as a permanent injury, till more positive evidence of its occurrence has been produced.

Treatment.—In recent cases, as has already been indicated, the displacement can easily be corrected by making traction on the thumb in the abducted and fully extended position, and at the same time making pressure over the dorsal aspect of the metacarpal. The main difficulty consists in maintaining the fragments in apposition. Immediately the extending force is relaxed, the long fragment again slips upward and backward on to the dorsal aspect of the trapezium. In recent cases, therefore, after the displacement has been corrected, the thumb should be fixed in the reduced position for three weeks, to allow the palmar fragment to unite to the main body of the bone in good position. The best splint is a palmar one, as originally suggested by Bennett, extending from the tip of the thumb across the base of the hand, and projecting beyond the ulnar side of the wrist. The lower end of the splint is first fixed firmly to the end of the thumb by a few turns of adhesive plaster, or of a bandage. The thumb is then fully abducted and extended, and the long dorsal fragment of the metacarpal made to resume its normal relation to the trapezium and the short palmar fragment, by pushing the splint downwards. The abduction and extension are kept up by applying a bandage round the wrist and hand so as to catch in the end of the splint which projects beyond the ulnar margin of the wrist, and push it downwards and to the radial side. An alternative method is to mould a poroplastic splint to the wrist and thumb after reducing the displacement, the splint being moulded to the fully abducted thumb, and bandaged firmly in position. When the splint is removed, gentle movement and massage should be practised for a week or ten days. A fortnight after removing the splint, that is five weeks after the injury, the patient may be allowed free use of the hand.

In cases where the displacement cannot be reduced, nothing is to be gained by fixing the thumb, and the patient should be encouraged from the first to persevere with passive and active movement of the thumb at the carpo-metacarpal joint.

Prognosis.—In four cases which we have been able to follow up, the ultimate result as regards the function of the thumb has been good. In two of them the patients did not come for treatment till four weeks, in the other two till three weeks, after the injury. One of those patients was a policeman, the other three were manual workers, and although in all there is some permanent displacement of the metacarpal, none suffered practical inconvenience from the injury when seen some months after treatment had been discontinued. One man admitted that he had an occasional twinge of pain when he made a strong effort with the thumb fully abducted, and another that his thumb felt tired after a long day's work shovelling coal, but in none of these cases was the patient's efficiency as a worker or his wage-earning capacity diminished. The range of movement in all the cases was good.

In his original communication, Bennett described the case of a girl who, two years after having fractured her metacarpal, failed to grasp or lift with certainty any object requiring a wide gape of the thumb. He stated that, in general, the injury renders the thumb for many months lame and useless. Beatson, in describing his case, notes that two and a half weeks after treatment had been begun (five weeks after the accident), a decided improvement had taken place in the usefulness of the hand, and that "later all disablement quite passed away." Prichard records that in his case, which he says was practically untreated, the power of opposition did not return for more than three months.

From our experience of the four cases in which the ultimate result was observed, and our observation of other cases during the

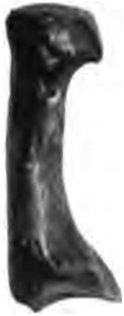


Fig. 1.

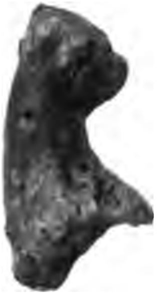


Fig. 2.

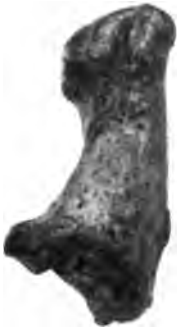


Fig. 3.

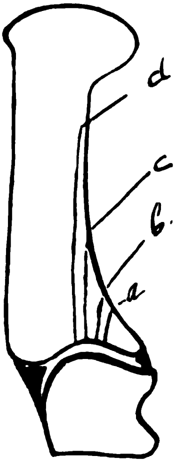


Fig. 4.

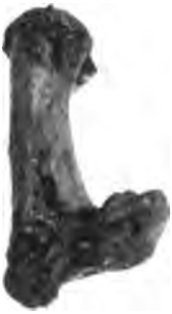


Fig. 5.

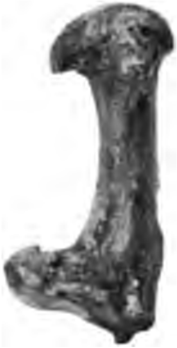


Fig. 6.

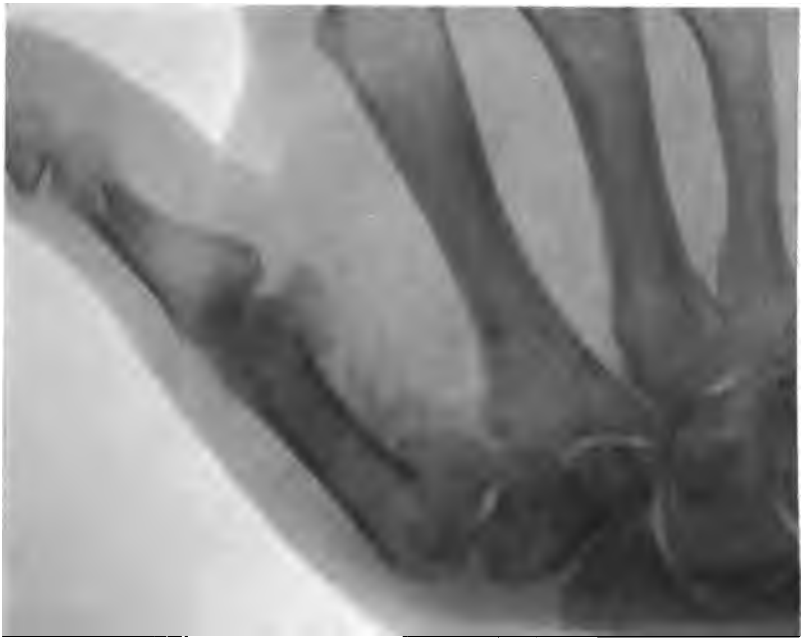
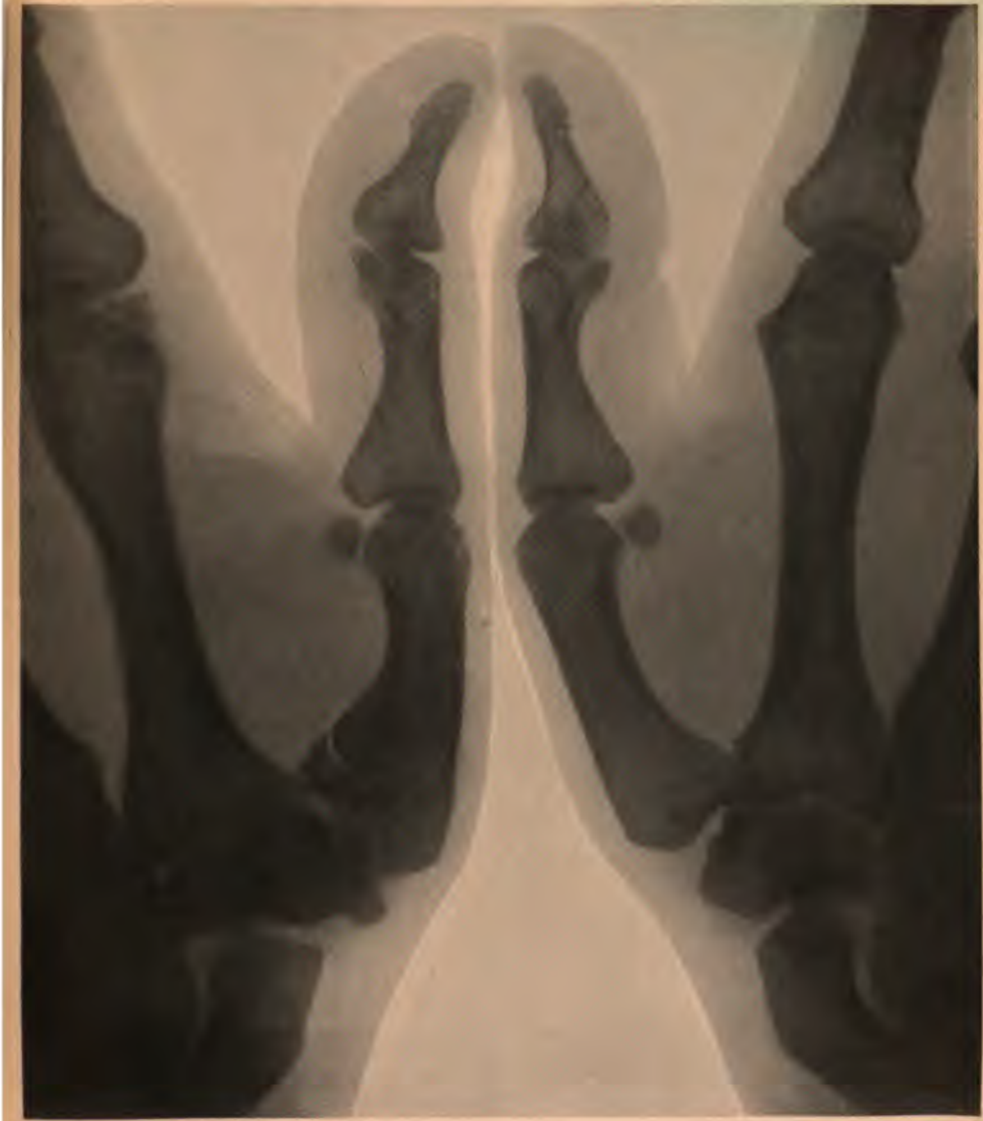


PLATE VIII.



time they remained under treatment, we should be inclined to put the period of serious disablement of the injured thumb at about six weeks, although in many cases, especially those which have not been treated, the full power of the thumb may not be restored for some time longer.

We believe that complete recovery is to be ultimately expected in the great majority of cases, the case referred to by Bennett, in which permanent weakness remained, being the only recorded one of its kind, and probably therefore exceptional.

Relative frequency of the injury.—Including our own series, the recorded cases of Bennett's fracture number twenty-five, the specimens ten, giving a total number of thirty-five. Bennett is of opinion that the fracture is the most common simple fracture of the metacarpus. Our own experience entirely confirms this view, as during the period in which we have observed the fifteen cases recorded above, we have not seen more than ten simple fractures of other metacarpal bones.

The slight violence required to produce the fracture, and the frequency of the accidents which may cause it, would alone suggest that the injury must be a common one.

The general failure to recognise this injury may be due to several causes. First, as many of the patients under our care at first regarded the injury as a trivial one, and only applied for treatment some weeks after they had been hurt, it seems highly probable that many people who meet with the injury may never apply for treatment at all. Secondly, it is probable that many who have seen cases of Bennett's fracture have not thought it worth while to record their experience, the injury being relatively an unimportant one. Thirdly, owing to the scant notice which it has received in text-books on Surgery, many are probably not aware that such an injury occurs, and may have allowed examples of it to pass unnoticed.

The total number of recorded cases is so small, that positive statements as to the relative frequency of Bennett's fracture are perhaps premature, but we are decidedly of opinion that the injury is a common one, and we are inclined to believe that Bennett's opinion, that it is the most frequent simple fracture of the metacarpus, is correct.

LITERATURE.

1. BENNETT.—*Dublin Journ. Med. Sc.*, vol. lxxiii. p. 72. 2. BENNETT.—*Brit. Med. Journ.*, Lond., July 3, 1886. 3. BEATSON.—*Ibid.*, May 5, 1900. 4. PRICHARD.—*Ibid.*, June 23, 1900. 5. DUPLAY et RECLUS, "Traité de Chirurgie," 1897, vol. ii. p. 535. 6. STIMSON.—"A Treatise on Fractures and Dislocations," 1899, p. 287. 7. HOFFA.—"Lehrbuch der Fracturen und Luxationen," 1896. 8. E. VON BERGMANN, P. VON BRUNS, und J. VON MICKULICZ, "Handbuch der Praktischen Chirurgie," 1903, p. 332. 9. D'ARCY POWER.—*Encyclopædia Medica*, article "Fractures."

10. **Dentu** et **Delbet**, "Traité de Chirurgie," 1896. 11. **Scudder.**—"Treatment of Fractures," 1901, p. 251. 12. **Polaillon**, article "Main," *Dict. Encycl. des Sciences méd.* 13. **Hamilton.**—"Fractures and Dislocations," 6th edit., p. 722. 14. **Thomson** and **Miles.**—"Manual of Surgery," 1904, vol. i. p. 481.

HERNIA.

By **Rutherford Morison**, F.R.C.S., *Surgeon to the Royal Infirmary, and Consulting Surgeon to the Dental Hospital, Newcastle-on-Tyne.*

(*Continued from page* 216.)

(Plates IX. and X.)

Umbilical Hernia.—Three varieties of this form of hernia are recognised—(1) Congenital hernia; (2) children's hernia; (3) adults' hernia.

1. The *congenital variety* is rare, and is improperly described as a hernia, for it depends on arrest of development and imperfect closure of the anterior abdominal walls over the abdominal contents, which escape through the opening left. It may vary in size from a slight thickening at the umbilical attachment of the cord, to a swelling which includes the liver, spleen, and other viscera. The coverings are translucent, and the contents of the swelling may be seen through them. If a small defect only is present, it may be overlooked and regarded merely as a thickening of the cord, the intestine lying in the substance of the umbilical cord without any peritoneal sac. In such a case, portions of the intestine have been tied in the ligature applied to the cord, and the true condition has only been realised when death from septic peritonitis followed natural separation of the cord.

For the more formidable conditions nothing can be done, and the babies all die. For the remainder it is important to remember that immediate operation has given good results, which cannot be said of any other treatment, except in the smallest examples. Only these are capable of cure without operation, and they can be treated after reduction by ligaturing and cutting off as much of the cord as is safely possible, dusting the stump with an antiseptic powder, and dressing with a pad of dry boracic lint strapped on by sticking-plaster, which must be worn continuously.

The steps of the radical operation are—first to reduce the viscera into the abdominal cavity, then to excise the swelling and the attachment of the cord, and finally to suture the opening left.

2. *Umbilical hernia in children.*—In a normal child the umbilical ring is just of sufficient size to allow of the passage of the vessels of the cord. When the cord drops off, if the intra-

abdominal tension is increased, as so frequently occurs in children improperly fed or with digestive disturbances, the umbilical cicatrix may bulge, and a hernia may develop. The swelling often appears about the sixth month, and has a conical shape; it seldom reaches a large size, strangulation in it is very rare, and spontaneous cure of it usually occurs before the fourth year. I have, however, had to operate on two children, æt. 7, members of one family, whose hernia, in spite of the greatest care, refused to get well with pads and trusses of every conceivable variety.

The treatment is simple, and no complicated apparatus is so good as the simple old-fashioned pad and strapping. The pad can be made of a round flat cork, covered by lint, large enough to reach well beyond the edges of the umbilical ring, and fixed by a broad strap of indiarubber or other non-irritating waterproof plaster, passed round the body and worn continuously. Attention must be devoted to the feeding of the child and the condition of its bowels, and to coughs or difficulty in micturition, or anything else likely to cause abdominal distension or straining. As a rule, one year of such treatment suffices for a cure; if not, operation is necessary. The operation is removal of the sac, and suture of the ring.

3. *Umbilical hernia in adults.*—This occurs most frequently in stout women, mothers of large families, obesity and pregnancy both acting as predisposing causes, by stretching the umbilical cicatrix.

The size of the swellings may vary from that of a walnut to that of an adult head. Owing to their exposed situation, they are liable to attacks of inflammation, and from this result adhesions, omental frequently and intestinal occasionally. The covering is thin and ill-nourished, and ulceration of the exposed and irritated surface is not uncommon in neglected individuals.

Some years ago I attended a woman who had been suffering from such a neglected ulcer on the coverings of a large umbilical hernia. During a fit of coughing the hernial coverings tore through the ulcerated area, the greater part of her small intestines were extruded through the opening, and when I saw her she was sitting in a chair nursing her intestines, which were covered only by a dirty towel. Death from septic peritonitis was the result of this accident.

The sac, as it gradually grows, tends to become loculated, and in old-standing cases many loculi are found, some filled with adherent omentum, some with intestine. Occasionally, the whole sac is lined with omentum, and the herniated intestine, frequently transverse colon, has for its coverings an omental as well as the ordinary peritoneal sac.

Strangulation of the contents is far from uncommon, and the operation for its relief is, in consequence of the difficulties met with, followed by a high mortality.

The treatment is palliative or radical. Palliative treatment, by pads and bandages or trusses, may be the only justifiable course, the variety of these articles recommended being eloquent testimony to the difficulties encountered. If the hernia is reducible, the most generally satisfactory appliance is a strong and simple abdominal bandage with a big flat pad; if it is irreducible, the best that can be done is to try to prevent an increase of its size by a cup-shaped pad and suitable belt.

Treatment by operation should be more frequently undertaken than it is, and it should be done when the hernia is small and reducible. No other method will cure it; the difficulties of restraining it are great; strangulation is to be dreaded; and the rule should be that every such hernia in a healthy person should be treated by operation. The operation is also to be strongly advised in cases liable to strangulation, when the swelling is painful and irreducible, and when the skin covering is extensively ulcerated.

The operation is performed in the following steps:—(1) The skin incision—long, transverse, enclosing the stretched skin in an ellipse. (2) Opening the sac and reducing the contents. Adherent omentum and intestine are separated, taking care not to tear the bowel, and all bleeding points on either are tied with fine catgut. To reduce the contents easily and without bruising, it is usually necessary and advantageous to enlarge the opening downwards in the linea alba. (3) Excision of the whole sac. (4) Suture of the opening by catgut through the cut peritoneum and fibrous edges. (5) Inversion of the sutured ring, and careful broad apposition of the bared anterior sheath of the rectus over it, making a keel towards the abdominal cavity. (6) Suture of the subcutaneous fat and deep layers of the skin to the aponeurosis, and suture of the skin after the formation of a button-hole opening in the upper or lower flap, for the introduction of a drainage tube into the depths of the wound.

I have long since ceased to carry out the more elaborate operations described in surgical works. It seems a reasonable suggestion, from an arm-chair, to open the sheath of the recti and bring the muscles together over the opening in the middle line. The attempt to do so on the operating table is generally worse than useless, for the muscles are often so far apart that they cannot be drawn together when found; and, in the fat subjects of umbilical hernia, are so brittle as not to be worth bringing into apposition when they are found. The result of such an operation is to weaken and damage the abdominal wall.

The operation for a large irreducible umbilical hernia is always serious, sometimes attended with very grave difficulties. The latter are all overcome by patience and care, and, considering the suffering and danger occasioned by such herniæ, I advise operative treatment much more frequently than is allowed to be justifiable in works on the subject. Though a radical cure cannot be promised, the patient can be made comfortable, and may, by continually wearing an easy belt, live without risk of strangulation.

Perhaps one of the greatest dangers of the operation concerns the administration of the anæsthetic. A patient on whom I had completed the operation, only the wound dressing remaining, began to retch and tried to vomit. No one, who has not experienced the power of the diaphragm in these stout patients, can form any fair estimate of its capacity. This case supported my belief that the diaphragm can burst any ordinary thing in the way of sutures or dressings, for, in the act of retching, the sutures tore through, and before anything could be done, nearly all the small intestines were shot out on to the surrounding towels. After the patient had been put deeply under the anæsthetic, the abdominal contents were replaced, and the wound was examined. Some of the sutures were found to have torn through the tissues, others had yielded at their knots, and others were cracked and broken. The sutures were replaced, and the patient was kept deeply anæsthetised till the dressing was completed. She suffered from shock, but recovered. Another patient, subject to attacks of bronchitis, developed pneumonia immediately after the operation. At the end of the first week, during a violent fit of coughing, her intestines were extruded. They were washed in warm saline and replaced. The deep wound was brought together by strong silver-wire sutures, passed through the whole thickness of the abdominal wall, and included the inner half of the two recti muscles. The skin wound was closed independently. She died from pneumonia a few days later. Post-mortem examination showed that the deep parts of the wound were open, and the intestines were lying under the skin. The silver-wire sutures were loose, having cut through the peritoneum and fibrous and muscular structures of the abdominal wall. The sutures I ordinarily use are of catgut; silk and wire diminish the risk mentioned little, if at all, and there are serious objections to both. After the application of a dressing, the wound is supported by long, broad strips of strong adhesive strapping, and these are applied in a special manner. The first strap passes from the lower ribs behind over the centre of the abdomen to the back of the pelvis on the opposite side; the second, from the pelvis to the back of the ribs on the opposite side, one crossing the other at the dressings over the wound; and a third is carried transversely over the umbilical site, from the back of one ileo-costal space to the other. These straps I call after the respective muscles they represent—the external oblique, internal oblique, and transversalis. They are a strong support, and, unlike simple transverse straps, allow for some tympanitic distension in the parts of the abdomen uncovered by them. A narrow, firm, many-tailed bandage completes the dressing. As soon as the patient has recovered from the effects of the anæsthetic, the head and shoulders should be raised, and the knees supported on pillows, to relax the anterior abdominal wall.

VENTRAL HERNIA.—Spontaneous forms appear most frequently above the umbilicus, where the linea alba is broadest, and, normally, has a less close structure than elsewhere. In the middle line and above the umbilicus a special interest attaches to them, because they are frequently associated with dyspeptic symptoms, said to be due to dragging on the omentum. Before concluding that stomach symptoms are the result of an epigastric hernia, it is wise to exclude every other known cause; and even when this has been done, it is not safe to promise that cure of the hernia will be followed by disappearance of dyspepsia. Herniæ of this kind seldom reach a large size. The bulk of the swelling consists of subperitoneal fat, in which is found a small sac, and this may or may not have adherent omentum in it.

The most frequent cause of ventral hernia is traumatism; and of late years abdominal operations, followed by unsatisfactory closure of the abdominal walls, have produced an abundant crop of herniæ through the scar. The majority occur below the umbilicus, because this has been the most favoured operative site. The larger ones are, like umbilical herniæ, only to be cured by difficult and serious operations; when small and reducible, operation is safe, and the result satisfactory.

Treatment.—Some of the larger varieties are most safely dealt with by a supporting bandage.

Operation should be performed on all others in persons of fair health and not of too advanced age. In each situation the details of the operation differ, but the principles in all are to remove scar tissue, and to close the opening in the abdomen by layer sutures of healthy to healthy tissues, leaving a barrier as thick as possible against recurrence. Besides hernia from open wounds, traumatism may result in herniæ from subcutaneous rupture of muscles, and these are most frequently found in the neighbourhood of the rectus and as lumbar herniæ. The treatment of them is similar to that of the last variety, namely, to remove scar tissue and to close the abdominal opening in layers by the broad apposition of healthy structures.

THE ACCIDENTS OF HERNIA.—1. *Strangulation.*—Strangulation of a hernia is perhaps the most serious and most important of surgical emergencies. So serious is it, that death is practically certain if it be overlooked or neglected; so important, that if recognised and properly treated, recovery is practically assured.

(A) *Diagnosis.*—If a hernial swelling which has been soft, painless, tympanitic, and reducible, suddenly becomes hard, tender, dull on percussion and irreducible, strangulation in it has occurred.

A hard swelling at any of the hernial sites, accompanied by symptoms of intestinal obstruction, is not likely to be an inflamed lymphatic gland or irritated undescended testicle, but a strangulated hernia requiring immediate reduction. Many fatal mistakes could be avoided if students were taught that in every case of abdominal pain and vomiting it was their first duty to examine the hernial sites. Intestinal obstruction symptoms, with absence of a testicle on one side of the scrotum, suggests, even in the absence of an external swelling, that strangulated hernia may be the cause. After a large dose of opium, and after gangrene of the gut, the urgent symptoms may all disappear, and this has to be remembered in making a diagnosis. The personal factor, too, must be borne in mind as influencing the symptoms. A strong-willed powerful man may walk into hospital with gangrene of the gut, but present little evidence of so serious a lesion, except the cessation of previous symptoms.

(B) *Treatment.*—There is only one treatment for strangulated hernia, and that is immediate reduction of the hernia. This may be accomplished by either taxis or operation; and there is no excuse for a medical man who leaves his patient with the hernia unreduced for any longer than is necessary to make arrangements for the proper performance of the operation. I confess to a fear of taxis, from having seen calamities follow it that would certainly have been avoided by herniotomy. More than once I have observed reduction *en masse* follow what appeared to be gentle and satisfactory manipulation by skilled hands. It is time that the mention of taxis, as the ordinary treatment for strangulated hernia, should be expunged from surgical text-books. It should only be borne in mind as a special resource for very early and exceptionally situated cases, and as an inducement to patients too timid to face straightly the inevitable.

The operation is performed in the same manner as that for the radical cure of hernia, as previously described. Only the points special to the operation for strangulated hernia need be dealt with here. In inguinal cases the ordinary incision should be prolonged downwards into the scrotum, to give free access. The sac is exposed by division of the layers covering it between two pairs of clip forceps, by which they are nipped up and drawn forwards. The sac is opened and washed with hot salt water (1 drm. to a pint); the constriction is then relieved, the contents are drawn down and carefully examined, and the operation is completed by performing a radical cure in all early cases.

The ordinary operation is, as a rule, easy, though difficulties of the most confusing kind are occasionally met with. The most important difficulty in ordinary cases is that of recognising when the sac is opened and the gut exposed. The operation should be done steadily and systematically as soon as the neighbourhood of the sac is reached. It is an excellent plan to nip up the coverings transversely to the swelling, between the thumb and the finger, by which an estimate of their thickness may be formed, and satisfactory proof established that they move freely over the underlying gut. This point settled, the same fold is caught on either side by hæmostatic forceps, between which it is held forward and divided. A fresh grasp is to be taken on either side in a similar way, after the division of the first layers, until the sac drawn forwards away from the bowel is safely opened. There is no known anatomical or other guide which tells with certainty that bowel has been reached, but the escape of fluid usually makes this plain; and it should be regarded as an aphorism that, if there is any doubt, the sac is not opened. Intestine, if fairly exposed, can scarcely fail to be recognised as such, and what looks like bowel is usually sac distended by fluid. If the fluid is dark and bloody, the resemblance to bowel is so close that it requires a courageous belief in the probability of the above statement to make the necessary incision. In one case I made a post-mortem in which hernia and sac were reduced *en masse*, from failure to recognise that the sac was unopened; and I have been called upon to perform laparotomy after an operation for hernia, unsuccessful from the same cause. On the other hand, I have only once opened the bowel by mistake, and that in a femoral hernia where the inflamed intestine was adherent to the sac wall. Careful cleansing, followed by a continuous suture through all coats close to the cut margin, and a few Lembert sutures outside of this, goes far towards making the accident inconvenient rather than dangerous. The strangulated contents being certainly exposed, the constricting part should be fairly divided and dilated, and the contents of the sac gently drawn down for examination of the strictured portion, because that is the place where damage is most likely to have been inflicted. Additional care must be taken in handling the intestine of old people, for at times (though apparently normal) it is so brittle as to tear like tissue-paper. If the gut is to be returned, this should be accomplished without force, and its presence in the abdominal cavity must be certified by the introduction of a finger after it. If omentum has to be ligatured and cut off, and this is only to be done when it is damaged, half an inch of stump should be left beyond the ligature, which is to be tightly secured by at all events one transfixion. Care must be taken in reducing the stump not to disarrange the ligature, for I have seen a case in which, at the moment of somewhat forcible reduction of the omental stump, the ligature slipped, hæmorrhage followed, and the wounded omentum was with difficulty recovered by forceps pushed into the abdomen. The patient died of peritonitis, it may fairly be said in consequence of this accident, for the case was otherwise a favourable one.

As a rule the sac may be easily separated from its connections by drawing on it and teasing it out with the fingers and dissecting forceps. It should then be isolated up to a point within the ring, tied firmly round its neck with strong catgut and a Staffordshire knot, and cut off half an inch outside of this. The proper removal of the sac is the most important item in the radical cure of hernia, as ordinarily performed, for by it the peritoneal dimple within the ring is obliterated, and a month's rest with careful bandaging suffices to cure a fair percentage of cases.

For femoral hernia the incision I employ is oblique below and in the line of Poupart's ligament. After the sac has been opened and cleansed, it is separated on the inner side up to Gimbernat's ligament. A hernia director is then pushed through between the sac and Gimbernat's ligament, and so outside of the former. Gimbernat's ligament is notched. The sac is then further separated and drawn down, and its neck is divided from below upwards by blunt-pointed scissors so far as is required to relieve the constriction. The object of this manœuvre is to prevent that high notching of the sac produced by the usual cut made with a bistoury from its inside, which prevents the satisfactory subsequent closure of it by ligature.

The intestine may be so much damaged as to make its recovery doubtful. When it is of a reddish-brown or a plum colour, and the colour does not rapidly disappear when the constriction is relieved, or when it is incapable of contracting if squeezed between the finger and thumb, then one of two courses may be followed—(1) Immediate resection; or (2) a long suture should be attached to the mesentery, the constriction should be divided, and the bowel should be returned into the abdominal cavity, but retained near the ring by the mesenteric suture; a full-sized glass drainage tube is left beside it, keeping the canal patent and allowing of the escape of intestinal contents, should rupture occur. No sutures, or few, should be used for the wound, and the sac should be left open, lightly packed with antiseptic gauze. I prefer the former of these methods as being safer when the circumstances favour it. When gangrene of the gut has occurred, if it be limited to the constricted ring, this may be infolded by Lembert's sutures and returned to the belly. When gangrenous spots appear on the convexity of the intestine, it should be treated as if totally gangrenous already, for if returned into the abdomen, it soon becomes so from thrombosis of the mesenteric vessels. A portion of bowel which is torn beyond repair during the operative manipulation, or the mesentery of which is seriously damaged, should be resected.

If the intestine is already gangrenous, there is great difference of opinion amongst surgeons as to the method of treatment to be adopted. I will shortly describe my own practice. If the patient is in fair condition, and the abdomen is not distended, I perform resection of the gangrenous gut, taking care to go wide, fully 1 in., of the constricted area, and then make an anastomosis. For this purpose I prefer suture without any mechanical aid, and a lateral anastomosis after closure of the ends; but in cases done with little assistance, or in which the operation has to be performed hurriedly, the Murphy button is as excellent as it is ingenious (or my own bone button does well). If the abdomen is much distended, however good the condition of the patient may be, I drain the intestine, leaving a fæcal fistula. On opening the gangrenous intestine, one of two things may happen. Frequently the discharge is very small in amount. In that case the opening must be clamped, the constriction must be freely divided, a healthy portion of gut must be drawn down, and a glass tube tied in it for purposes of drainage; if the patient recovers, at a subsequent date resection of the fæcal fistula is performed, and anastomosis made. Again, when the gangrenous gut is opened, there may be a free discharge of the intestinal contents following the opening. In this case, if the patient is very feeble, it is as well to do nothing more, thus leaving the adhesions round the strictured bowel undisturbed; the fæcal fistula resulting may be closed by a subsequent operation if the patient recovers, and if it does not do so spontaneously.

2. *Accumulation of fæces in the prolapsed intestine.*—This complication is mentioned in all books on the subject, and has consequently received more consideration than its importance demands. Grave errors have arisen, from information concerning this matter conveyed without duly emphasising essential qualifications. Arrest of fæces in herniated intestine is rare. It never, so far as I know, occurs in connection with the small intestine unless there is strangulation, and the evidence of it must be overwhelming before it can be accepted in any given case as having occurred in the large intestine. Active symptoms may safely be regarded as due to strangulation; fæcal obstruction can produce nothing more than constipation. More than once I have felt and reduced considerable masses of solid fæces from a herniated colon; but if obstruction symptoms were present, the hernial swelling was always tender; and this I attributed to commencing strangulation, for if the whole swelling could be reduced by taxis, the symptoms disappeared at once.

In old irreducible herniæ it is possible to avoid operation by the use of large enemata and massage of the swelling, but immediate operation should be advised if, after a fair trial, these remedies fail.

3. *Inflammation of the hernia* is another of the text-book complications which has given rise to serious mistakes. That this accident can occur is undoubted, but it also is very rare. The great majority of cases so diagnosed turn out to be strangulated, and innumerable lives have been lost through delay occupied in treatment by poultices, leeches, and ice-bags, to reduce a supposed inflammation. Apart from strangulation, injury and the

firm pressure of a truss are the most common causes of inflammation in a hernia, and the intestine is rarely if ever affected.

It may consequently be stated as an aphorism, that if there is disturbance of the gastro-intestinal tract, the hernia must be regarded as strangulated; for inflammation of it causes only symptoms and signs limited to the hernial swelling.

Whilst the possibility of inflammation involving the non-strangulated bowel may be doubted, there can be no question that the omentum in a hernial sac frequently becomes inflamed. This, with consequent adhesion of the prolapsed omentum, is the most common cause of irreducible hernia. Whilst mentioning the omentum, I should state my belief that it has not yet obtained the attention due to it from abdominal surgeons: like all structures with unknown functions, it has been assumed to be useless or even worse, judging by the advice given to excise it with or without sufficient excuse.

I hope again to show the important part it plays in many other abdominal conditions, but just now I must limit my remarks to some matters of interest in connection with its relations to hernia.

Occasionally I have observed in young boys a hard tender solid nodule in connection with the spermatic cord, somewhere between the testicle and the external abdominal ring. Exploration of this nodule has shown it to be tuberculous omentum in a hernial sac. (More rarely the nodule has been in the sac wall itself.)

In some of these cases the escape of fluid from the abdomen in quantity above normal, and an appearance of delicacy, together with the history obtained on subsequent inquiry, have suggested that the tuberculosis in the omentum was secondary to general peritoneal infection; but in other cases no such evidence was forthcoming, and the condition appeared to be due to primary tuberculosis of herniated omentum.

A rare, and so far as I know unique, case of omental hernia, in which the greater part of the omentum had become gangrenous, was sent to me for operation as a case of acutely strangulated inguinal hernia. An irreducible hernia had been in existence previously, when suddenly urgent illness developed in association with it. There was a large, tense, tender humour in the scrotum, and the abdomen presented all the signs of acute general peritonitis. On opening the hernial sac, the omentum present was found to be gangrenous, and adherent to the fundus of the sac by a narrow attachment. On drawing down the gangrenous omentum, I was surprised to find that an enormous mass, involving nearly the whole of it, could be withdrawn from the abdomen, and with it escaped a quantity of blood-stained fluid.

Close to the transverse colon the explanation of the condition was found; the omentum was twisted into a tight cord, through which no circulation could take place. Further examination showed that the omentum, fixed in the hernial sac by adhesions below, and fixed above by its normal attachments, had undergone such torsion as to arrest the flow of blood through its vessels of supply.

The exact conditions can be illustrated by taking hold of a towel by two corners and rotating the central free portion.[1]

Another condition of the omentum, though usually consequent on operation, deserves mention. After an open operation for hernia, or its reduction by taxis, not infrequently a hard tender lump may be discovered some time later in the abdomen. In the mildest and most frequent cases, beyond some tenderness of the swelling, no symptoms may be present, and the swelling and tenderness gradually disappear. In more serious conditions, health is not recovered after the operation; the swelling continues to be tender and increases in volume, a hectic temperature may develop, and the signs of intra-abdominal suppuration make their appearance.

In such a case,[2] some weeks after an operation for the radical cure of an inguinal hernia performed elsewhere, I operated, by abdominal section, for the relief of this condition. The operation was a most serious one, for it involved the separation of a large mass of densely adherent infiltrated and suppurating omentum; and in the purulent focus, silk ligatures which had been used at the previous operation were discovered. The position of the swelling in these cases may give rise to difficulties in diagnosis, if it be forgotten that it is not necessarily found in the neighbourhood of the hernia. Especially after operation the ligated omentum may retract, and the tumour, if one forms, may be found at any part of the abdomen. The only note of this inflammatory tumour that I have seen occurred in an abstract from German literature; and the author, whose name I have forgotten, describes it as an epiploitis.

In addition to these somewhat rare omental conditions, the use of the omentum in hernia cases must be mentioned. The physiological function of the omentum appears to be that of an abdominal policeman.

All sources of irritation in the abdomen are likely to be taken into its custody, and doubtless many hernia cases owe their lives to the fact that a portion of damaged bowel, returned into the abdomen, has been prevented from perforating by omentum wrapped round it, or that portions have been saved from gangrene by the extra-vascular supply derived from a piece of adherent omentum.

ILLUSTRATIVE CASES.

CASE 1.—*Littre's hernia and removal of Meckel's diverticulum; radical cure.* (Inf. Bk., 109, p. 559.)—J. D. O., æt. 16, miner, was admitted to the Royal Infirmary, 16th March 1903. A month before, the hernia suddenly appeared in the right groin, and caused him great pain till he got it reduced. He then got a truss, but it never kept the swelling properly up.

---

[1] *Northumb.-Durham Med. Journ.*, April, 1903, p. 211.

[2] *Ibid.*, January, 1903, p. 103.

On admission.—Over the situation of the external ring there was a slight abrasion (said to have been caused by the truss). The spermatic cord at the upper part of the scrotum appeared to be normal. At the external ring, and projecting from it, a small soft reducible swelling, like an omental tag, was felt, which returned when the patient stood up and coughed. The external ring was large and patulous.

OPERATION, *March* 17, 1903.—On opening the sac the testicle was not exposed. The sac contained a piece of small bowel, like a large vermiform appendix, which was recognised to be a Meckel's diverticulum. It was adherent posteriorly to the sac wall. The diverticulum was pulled down, and its relation with the small intestine was determined. It arose from the convexity of the intestine, and had no definite mesentery, though a large vessel was seen running longitudinally along its posterior aspect. The diverticulum was clamped about half an inch from the bowel, a purse-string suture was passed, encircling its base; it was ligatured at the part compressed by the clamp, and excised; the stump was then carbolised, tucked into the intestine, and the purse-string suture was tightened. Over this, two catgut Lembert sutures were inserted in the transverse axis of the gut. Radical cure.

The diverticulum removed was 2 inches long. (Whilst *in situ* it was at least double that length, but after removal it contracted rapidly.) It was a typical specimen of Meckel's diverticulum, and contained some soft fluid fæcal matter.

March 27, 1903.—Left hospital healed.

April 25, 1903.—Returned for examination. Perfect.

CASE 2.—*Interstitial hernia.* (Inf. Bk., 108, p. 552.)—W. N., æt. 65, miner, was admitted to the Royal Infirmary, 9th February 1903 (Plate IX. Fig. 2). After an accident in the pit in 1864, the patient first noticed a swelling in the groin, which has gradually increased towards the scrotum. A week before, the hernia came down and made him sick, but he succeeded in reducing it. It had remained painful since.

On admission the patient looked a strong, healthy man. There was a large swelling at the lower part of the abdomen on the right side, extending into the scrotum. The swelling was soft and reducible, with a gurgle. The scrotal portion went back easily, the upper part with more difficulty. It all returned suddenly when the patient coughed. A small tender nodule, which we supposed to be an atrophied testicle, could be felt at the upper part of the scrotum. On making the patient put his abdominal muscles into action, it was found that the upper part of the swelling was covered by muscle. The right testicle felt normal.

OPERATION, *February* 17, 1903.—A long oblique incision was made, extending from over the pubic spine internally to the anterior superior iliac spine externally. The external oblique was found to be stretched over the swelling, and was thinned. The external ring was not very large. The external oblique was divided in the line of the skin incision, and in doing this the sac, which was closely adherent and thin, was opened. It contained a large amount of small intestine, which was reduced. The testicle lay just above the cruro-scrotal fold. It was smaller than usual, had a definite mesorchium, and was separated from the epididymis, which reached the upper portion of the scrotum, and probably was the body thought to be an atrophied testicle. The sac was separated, and it was found that the iliac portion lay over the internal oblique muscle, which was well developed. The neck of the sac opened into the belly about the normal position of the internal ring, and admitted two fingers. The deep epigastric artery could be plainly seen as it passed upwards on the inner side of the opening. The sac was very thin; it was covered by no subperitoneal fat, and the spread out cord was firmly adherent to it. The cord was separated and carefully ligatured, then the sac was tied above its neck with a Staffordshire ligature, and the testicle and the sac were excised. The canal was entirely closed by suture of the arched fibres of the internal oblique and transversalis, which were well developed, and of the conjoined tendon above, to Poupart's ligament below. The external oblique was sutured, double-breasted fashion, with seven mattress sutures of thick catgut and a continuous blanket suture of the same.

February 24, 1903.—Left the Infirmary all healed.

Case 3.—*Recurrence of hernia at inner part of scar, and hydrocele of the tunica vaginalis testis on the same side.* (Inf. Bk., 108, p. 549.)—J. L. T., æt. 32, miner, was admitted to the Royal Infirmary, 30th May 1903. In February 1899 I had performed an operation for the radical cure of an inguinal hernia on the left side.

On admission the scar looked very good, but when the patient stood and coughed, a small hernia appeared at the inner end of the scar, and bulged into the upper part of the scrotum. There was a moderate-sized hydrocele of the tunica vaginalis of the testis of the same side.

Operation, *June* 1, 1903.—The old scar was excised in its whole extent. It was difficult to find any anatomical landmarks, as the structures were much altered by scar tissue. The external oblique was slit up. A small sac was found at the inner end, extending on to the body of the pubis. It was separated, ligatured, and cut away. The opening through which it had come was closed by suturing the conjoined tendon to Poupart's ligament. The external oblique was resutured, and the hydrocele was opened and the tunica vaginalis turned inside out and retained by sutures. The testicles appeared to be normal.

June 13, 1903.—Healed.

July 17, 1903.—Result perfect.

Case 4.—*Hernia relapsed into "Kochered" sac.* (Inf. Bk., 108, p. 504.)—W. G., æt. 24, was operated on in January 1899, by me, for radical cure of left inguinal hernia (Plate X. Fig. 3). Patient says that four or five months after the first operation he noticed a swelling. It had not troubled him, but he came to report himself. There was a bulging swelling in the groin when he stood up. On reducing the swelling, which was readily done, the little finger could be made to follow it through a small round ring at the outer end of the scar. When he coughed, the hernia appeared at the outer end of the scar, and extended along the whole length to its inner limit.

Operation, *February* 12, 1903.—The sac was found between the skin and the external oblique muscle, in the position of a "Kochered" sac. It was surrounded by cicatricial tissue, but was easily separated. There was a distinct depression on the external oblique where the sac had lain. The sac was separated up to the opening through the external oblique, the defect in which was quite evident, but the fibres of the internal oblique were closely applied to the neck of the sac. The sac contained adherent omentum, which was separated and returned. The neck of the sac easily admitted a forefinger. The sac was cut off and its neck was closed by catgut suture. The external oblique was separated from the internal, and the hole in the internal oblique and transversalis was closed by a purse-string suture of catgut, and over this two catgut sutures were passed through the internal oblique to bury the purse-string. The divided external oblique was closed by interrupted sutures, and the place where the sac had lain was strengthened by a single mattress suture with a large bite.

February 19, 1903.—Left hospital entirely healed.

January 11, 1904.—Came back to report himself. The scar was perfect. No signs of weakness.

Case 5.—*Recurrent hernia.*—A man, æt. 30, was admitted to the Royal Infirmary, July 6, 1903. He was a fireman on board a steamboat. Seven weeks previously, he was operated upon in an hospital in New York for a strangulated left inguinal hernia, which had been down four or five hours. Through the courtesy of his surgeon in New York, we ascertained that Bassini's operation for radical cure had been done with catgut sutures. He was a month in bed and six weeks in the hospital, when he was sent home on a passenger ship with the wound not quite healed. On arrival at home he noticed a swelling.

On admission he was a big strong man, with no cough. In the left inguinal region there was an oblique scar, stretched and thin. Under the outer part of the scar there was a hernia like a moderate-sized bubonocele. Radical cure. Left hospital 18th July 1903, with wound healed.

Case 6.—*Recurrent hernia.*—A feeble-looking man, æt. 24, was admitted to the Royal Infirmary on 30th September 1903. Eight years before, he had been operated upon in Sunderland Infirmary for rupture. He had no trouble till a month ago, when he slipped, and a swelling appeared in the old position. There was a right inguinal hernia extending into the scrotum, and a scar over the inguinal canal.

Operation, *October* 1, 1903.—The sac was very adherent to the scar tissue. It was dissected away and ligatured high up. The elements of the cord were involved in the scar, and in their separation the vas was accidentally divided. It was sutured end to end with a single catgut suture. Radical cure. All healed 12th September 1903, when he left the hospital.

Case 7.—*Left scrotal hernia; bowel in sac wall; opened by mistake; suture of opening; radical cure.*—A boilermaker, æt. 34, was admitted to the Royal Infirmary, 28th November 1903. He first noticed a swelling about eight years ago, which had gradually grown bigger. It had never caused him severe pain, but when it came down much he had to stop work and reduce it. He wore a truss for four months at first, but ceased to use it because his skin became much irritated.

On admission he was recorded to be a healthy man with a considerable left scrotal hernia, which was easily reducible, and which had a patent external ring. The abdominal walls were in good condition.

Operation, *November* 1, 1903.—On dividing the superficial structures, the inguinal swelling looked like a mass of fat resembling omentum. The sac was diligently sought for, but none could be found. In searching for a sac, bowel was opened. Through this opening I introduced my finger, and judged from the size of the lumen that it was large intestine, and from its position and mobility probably sigmoid flexure. The opening in the bowel was closed with a purse-string suture, and over this interrupted sutures of catgut. The whole swelling was pressed through the inguinal canal into the abdomen; the veins of the spermatic cord, which were very large, were removed; and the inguinal canal was closed in the usual way, except that the external oblique was sutured in double-breasted fashion. The patient left the hospital entirely healed on 18th December 1903.

Case 8.—*Strangulated hernia; large intestine in sac; radical cure.*—A labourer, æt. 59, was admitted to the Royal Infirmary on 24th October 1903. Seven years ago the rupture first appeared. He wore a truss for two years, which was efficient. He then tired of it and put it aside, and had worn nothing and had no trouble for five years. The day before admission he worked all day, and at 7 p.m., just before leaving work, whilst lifting a weight, the hernia came straight down into the scrotum; there was cruel pain all night. The swelling became much larger and harder, and was very tender. He retched severely, but did not vomit. His bowels, which acted regularly before, did not do so the morning of admission, and he could pass no flatus.

On admission his general condition was good, but he looked pale and pained. There was a large tense right inguinal hernia distending the canal and the scrotum. It was tender at the neck, hard and irreducible.

The operation was performed immediately, sixteen hours after strangulation. The sac contained 3 or 4 oz. of blood-stained fluid, and about 8 in. of the large intestine (recognised by its bands) of a dark plum colour, and no omentum. Radical cure. Patient left hospital all healed, 10th November 1903.

Case 9.—*Strangulated inguinal hernia of three days' duration; line of gangrene at point of constriction; suture of gut; recovery.*—A strong man, æt. 42, was admitted to the Royal Infirmary, 19th October 1903 (a Monday afternoon). On the previous Friday afternoon, whilst ascending a ladder with a heavy plate, he felt pain in his right groin. Next morning (Saturday) at 7 o'clock he vomited three times. He went to work, and vomited again at 11.30. At 2.45 he had much pain, and vomited black matter. At 8 p.m. Dr. Ingram of Wallsend saw him, and advised his removal for operation at once, but this advice the patient refused to take. He had continued to be ill since, and unable to get a motion. He got out of bed and walked into the Infirmary on Monday.

On admission he looked in fair condition, but was pale and perspiring, and had a pulse of 124. There was a tense right inguinal hernia, reaching to the bottom of the scrotum.

Operation.—On opening the sac a quantity of reddish fluid spurted out. There was a small loop of very much congested bowel, tightly nipped at the internal ring. On relieving the constriction and drawing down the bowel, a pallid ring was seen to surround it. All the intestinal coats, with the exception of the peritoneal one, were destroyed. The gangrenous line was enfolded, and retained by Lembert's sutures. Radical cure.

The wound was all healed and he was discharged 2nd November 1903 (a fortnight later).

Case 10.—*Strangulated inguinal hernia of three days' duration; gangrene of gut; relief of strangulation and formation of fæcal fistula; death.* (Inf. Bk. 108, p. 561.)—H. J. M., æt. 35, miner, was admitted to the Royal Infirmary 2nd February 1903. Three days before, an old-standing hernia became strangulated. He had been attended by a doctor all the time, who was said to have ordered poultices and leeches.

On admission he appeared to be dying, and was cold and collapsed; there was a large left inguinal hernia.

Operation was performed at once. On opening the sac the gut was washed with normal saline and dried. All the constricting tissues were divided, and the intestine was drawn down till healthy bowel appeared. The sac was packed with gauze, and dusted with boracic acid powder; and the gangrenous intestine was opened and a Paul's tube was tied in to keep the dressing clean. The bowel drained well; the patient improved in condition, but never was satisfactory, and died on the fifth day after the operation. Post-mortem examination showed that the intestines were distended. There was no peritonitis. The gangrenous loop was about 6 ft. from the duodeno-jejunal junction. All the other organs were healthy. *Pathological diagnosis.*—Death from intestinal toxæmia.

Case 11.—*Strangulated hernia with undescended testicle; torsion of spermatic cord simulated.*—An office-boy, æt. 15, was admitted to the Royal Infirmary 29th September 1903. He was always aware that his right testicle was undescended but had never observed any hernial swelling. Three days ago, whilst playing, he noticed a painful swelling in the right groin in the position of his retained testicle. Whether it appeared suddenly or not he was unable to say. He felt sickly at the onset, but did not vomit. Since then the swelling had increased, and the tenderness remained; but he had never vomited; and flatus had been passed all the time, though the bowels were not moved.

On admission his general condition was good; face flushed, tongue white and coated, but moist. The right testicle was absent from the scrotum. There was a considerable swelling in the position of the inguinal canal, continuous with another in the scrotum. The upper swelling was hard, very tender and dull on percussion; the swelling in the scrotum was soft, œdematous, and translucent. The abdomen was quite flaccid, and not distended or tender.

The diagnosis lay between strangulated hernia with omentum in the sac, and torsion of the testicle.

Operation, *September* 29, 1903.—All the tissues of the abdominal wall were œdematous. On opening the sac, some clear fluid escaped from below; the upper part was apparently filled with blood clot. On clearing this out, a portion of tightly strangulated omentum, with hæmorrhage into it, was found in the congenital hernial sac. The omentum was excised. The sac was divided at the middle, and its upper part was separated, ligatured high up and excised, the lower part surrounding the testicle being left open. Radical cure. No steps were taken to fix the testicle, which was left in the upper part of the scrotum. He left the infirmary all healed, 8th October 1903.

CASE 12.—*Strangulated femoral hernia of four days' duration; operation; death.*—A thin feeble woman, æt. 67, was admitted to the Royal Infirmary on 24th November 1903. Twelve months previously she first noticed a lump in her right groin, but paid no attention to it. The lump suddenly became larger four days before her admission; she had pain in it, and pain and rumbling in the bowels, and she vomited. Her bowels could not move, nor had she passed wind. A doctor was called in, and tried to reduce the hernia, but failed, and ordered ice for the swelling, which had become hard. The symptoms gradually increased, the vomit became dark yellow and bad-smelling, and, in spite of enemata and purgatives, her bowels could not be induced to act, and she could not pass wind.

On admission the patient was in poor condition, and frequently vomited matter with a feculent odour. The abdomen was distended. There was a tense swelling in the right groin below the pubic spine, and the skin over it was red, slightly œdematous, and tender to touch.

OPERATION took place immediately after admission. On opening the sac, some blood-stained fluid escaped. The sac was washed out with hot normal saline. It contained some gangrenous omentum, in the centre of which was a plum-coloured knuckle of intestine. The intestine had not entirely lost its glisten, and could be seen to contract when pinched. Gimbernat's ligament and the neck of the sac were divided, and the omentum was ligatured and excised. The gut was drawn down, and the constricted portion was examined. This, though darker than the rest, did not appear to be gangrenous, and was returned into the belly. Radical cure.

After-progress.—For the first four days everything appeared to be satisfactory. All the symptoms were relieved, her bowels acted freely. Then she began to go down-hill, refused food, became delirious and finally comatose, and died on 7th December (fourteen days after the operation). Urine was passed normally till the last.

Post-mortem examination.—The wound was entirely healed, and the peritoneum normal. The loop of gut which had been strangulated was still dark-coloured, but there was no peritonitis over it, and no perforation. Both kidneys were markedly granular and cystic. Heart enlarged. Death from uræmia.

CASE 13.—*Umbilical hernia.*—In one case this was complicated by an ovarian tumour with twisted pedicle. A radical cure was performed at the same time as ovariotomy. Recovered.

Ventral hernia.—The cases were operated upon for the following conditions:—

1. Following ovariotomy, performed fourteen years previously in Leeds.

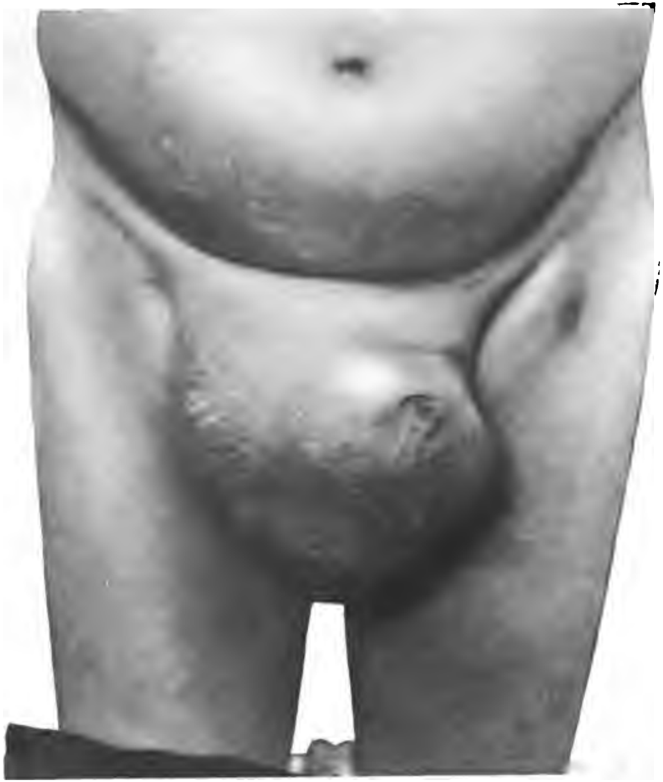


Fig. 1.—Inguinal Hernia burying penis, cured by operation three years ago and continues well.

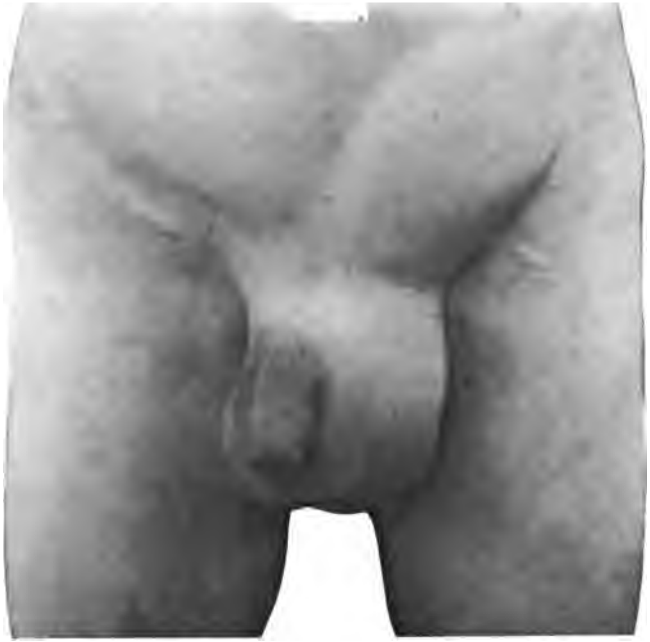


Fig. 2.—Interstitial Hernia, no testicle in the scrotum on left side.

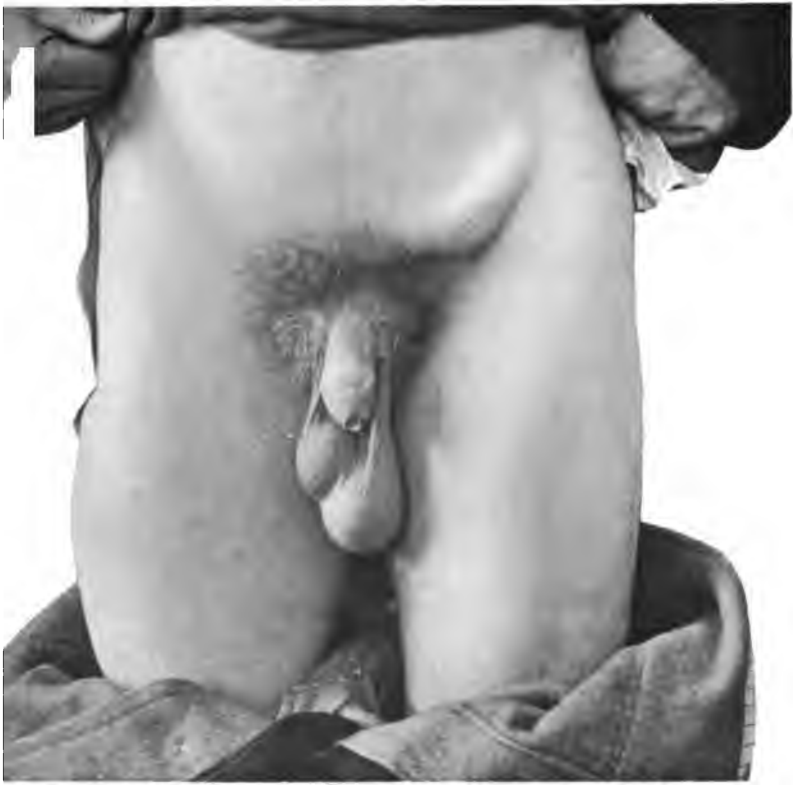


FIG. 3.—Interstitial Hernia into "Kochered" sac.

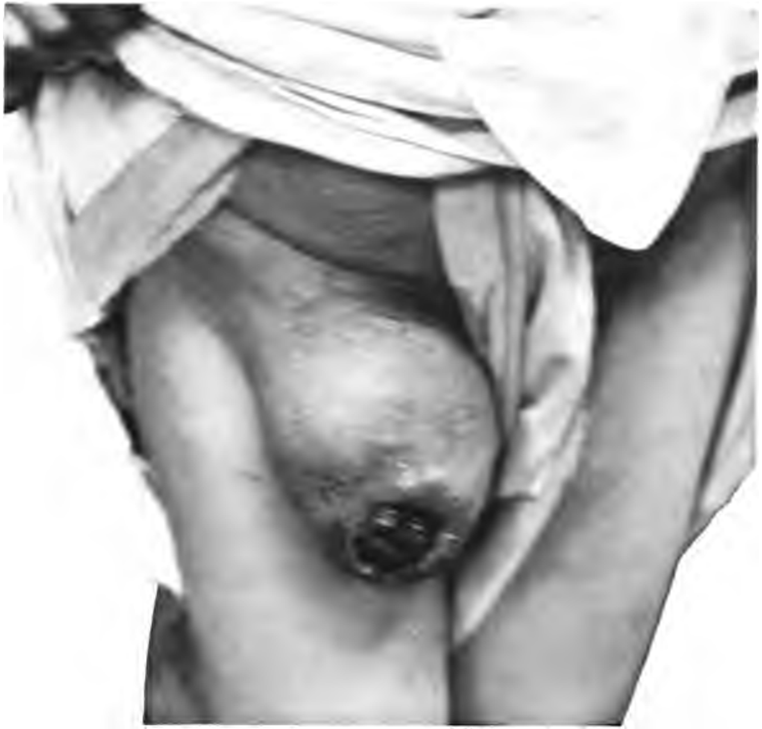


FIG. 4.—Large Femoral Hernia, skin covering sac ulcerated and sloughing. Cure by operation of Parry.

2. Following the radical cure of an umbilical hernia, four years previously. This operation was done to relieve chronic intestinal obstruction due to omental bands and adhesions. There was a small ventral hernia.

3. Following hysterectomy for fibroids and pyosalpinx, done in November 1901. The wound was infected and gaped, and hernia appeared shortly after the patient got up.

4. Following ovariotomy, six years ago. Broncho-pneumonia developed after this operation, and the wound gave way from coughing, and was never strong.

5. Following closure of colotomy wound, made for specific ulceration and stricture of syphilitic rectum.

6. Following operation two years previously for pyosalpinx. Wound suppurated profusely. Ventral hernia where drainage tube had been.

7. Operation of ventro-fixation, etc., for prolapse of uterus, November 1901. Wound suppurated. Six months after operation abdominal scar bulged. Swelling increased. No return of old trouble.

8. *Private hospital.*—Following operation, 4th December 1901. Removal of appendix, double ovariotomy, and supravaginal hysterectomy at the same time for pelvic abscess. Suppuration in wound and sinus for some time. Re-admitted 20th October 1903, with hernia of two weeks' duration. All these cases recovered.

THE RELATIONS OF THE INSANITIES TO CRIMINAL RESPONSIBILITY AND CIVIL CAPACITY.

By Sir John Batty Tuke, M.D., F.R.C.P.Ed.; and
Charles R. A. Howden, M.A., *Advocate.*

(*Continued from page* 256.)

IV. Delusion, Morbid Impulse, Lucid Intervals, Monomania.

It is matter of common experience that an insane delusion cannot be dispelled from the mind by any process of reasoning. Under the action of some strong influence it may appear to be temporarily suppressed, or even staggered for a moment by the force of argument; but when pressure is removed, it springs up again, either in the same or some slightly modified form. In certain instances there is a show of reasoning about a delusion, suggestive of the possibility of encountering or controlling it by argument. In many cases, for example, of suspicious delusion, plausible reasons are adduced for the direction the suspicion has taken, and the observer is apt to believe that if he succeeds in disproving the reasons he may put an end to the delusion. He soon, however, finds that even if his logical argument silences the patient, he has not reached the ground of the delusion at all. At the most he may have caused the delusion to take a slightly altered form, and it is then evident that what are apparently reasons are only a product of the delusion and not the grounds of its support; that they are in fact merely subordinate delusions. A delusion does not originate in a logical process, and cannot be dispelled by the application of reason to it.

No difficulty can exist in the mind of the most ordinary observer in recognising that the delusions which are manifested in acute cases of insanity are of morbid origin. Their rapid succession, and the absence of relation one to the other, distinctly indicate that they are due to a morbid brain process. It is equally evident that the permanent delusions occurring in the chronic insane belong to the same category. In the case of delusions, however, which arise slowly and gradually, and especially in the case of those in which the content is apparently derived from circumstances of previous life, there is often a strong suggestion that they are, or may be, merely the result of perverted or erroneous reasoning, into which a sane mind might conceivably have fallen; and it therefore may become difficult in individual cases to distinguish between them and ordinary cases of eccentricity. Such delusions may grow so gradually that there may be a period at which the delusion is not yet actually established, and the process of development resembles one of normal gradual conviction, the idea being carried into action, and evidence in support of it being sought for in an apparently logical manner. Even in these cases, which indeed are very rare, strict examination always discloses the fact that the real strength of the delusion lies in direct relation to some morbid condition, and that if we were to succeed in cutting off all the support which it seems to derive from apparently collateable facts, and all its apparently logical development, we should never touch its root at all. It has obtained as it were an independent existence, and can maintain its ground in face of ideas which are plainly contradictory, exactly in the same manner, as we have seen, that the mind may remain under the influence of states of insane feeling in spite of circumstances which would naturally produce an opposite effect. There are in fact close analogies between the development of delusions and that of insane feeling. In most instances the mind cannot be got even to look at the facts which would destroy a delusion; but even in the few cases in which it can be forced to do so, and in which the understanding is still capable of following the evidence, the result is the same. The insane often perceive that their delusions are regarded by others as such, and conceal them in consequence; but they never disappear entirely, except under the influence of new mental states which are equally morbid, or with the cessation of the condition of disease to which they are related. The influence of delusions thus depends greatly on the inaccessibility on the part of the holder to the ordinary means by which false ideas are corrected, and it is impossible therefore to refuse the inference that they are the products of disease.

Their influence differs considerably in another respect from that which is exerted by ideas over a sane mind. We have already remarked that in many of the extreme chronic cases the mind can scarcely be excited to action except through its delusions. In other cases, when the delusions are connected with states of insane feeling, we can readily understand that they exercise vast influence over the mind, because they form the channel through which the morbid nervous energy of the insane feeling is directed. But it may be said generally that delusions are more vividly present in consciousness,—more influential and more active, than any other ideas which can be brought before the mind. Whether a delusion will or will not be carried into action depends partly upon its nature and direction, and partly upon general conditions of mental weakness and excitability, or on the extent to which counteracting influences are excluded by it; but in every case it represents, so to speak, the point at which the mind is most alive and forms the dominant element in thought. In many instances delusions exercise scarcely any influence over action. They seem to occupy the imagination like a dream, and are often so remote from ordinary life that there is scarcely a possible point of contact; as for instance, in the case of a pauper who believes that he is a king, although he is surrounded by, and accepts, all the circumstances of pauperism. In instances in which delusion leads to action, the subject may be aware of its consequences and how it is regarded by others; and, while clinging to the delusion, they may still retain sufficient power of control to restrain action. In a large number of cases, however, a delusion would almost certainly be acted upon, unless under circumstances of immediate physical restraint; and, notwithstanding such influence, delusions often reach such a pitch of intensity as to exclude all considerations from the mind. It has always to be kept in view, when dealing with delusions, that they are not merely inaccessible to reason, but that they are far more powerful in determining action than corresponding ideas in the sane mind. In each individual case it is only possible to guess the influence they exert by their results, and by the analogies afforded by similar cases; but the presumption always is, that the amount of influence is greater than anything that can be imagined by appeal to ordinary experience, and that it is always possible that, like states of insane feeling, and indeed like the results of every other morbidly excited function, it may completely transcend in degree the equivalent phenomena of healthy life.

In every case in which the character of the morbid ideas and feelings is such that they result in action, we may conceive that their inherent intensity overbears resistance and excludes counteracting influences, in the same manner as a dominant idea or a violent emotion acts in sane life, but with greater force and intensity. In many instances insanity manifests itself, not so much by the nature of the mental antecedents, as by the force and rapidity with which they pass into action, or by their tendency to produce action without any definite mental antecedent whatever. We see this in its extremest forms in the epileptic lunatic, and in such forms as puerperal and alcoholic mania, the subjects of which are liable to violent action directed against the nearest object, without selection or premeditation, and accompanied with entire unconsciousness. In such cases we can discern nothing more than a violent outbreak of nervous energy, directed in an automatic manner into the nearest channels, but not preceded by any conscious antecedent. On the other hand, in many forms of insanity we find this tendency to action connected with distinct mental antecedents. Some of the less intense forms of mania are, as we have seen, characterised by extreme susceptibility to external impressions, and by the necessity of carrying every suggestion into precipitate action. In many chronic cases we find this tendency to action specialised and taking particular directions in the same way that permanent delusions succeed acute stages; while in some it appears as mere restlessness and aimless activity, corresponding to the general mental incoherence. Other cases are characterised by great irritability. The slightest provocation or external stimulus gives rise to wild outbursts of passion and violent acts. This extreme irritability is another characteristic of epilepsy, and it is frequently noticeable in the hereditary class. In the latter group, irritability may manifest itself in such a modified form as to suggest that it is merely an indication of a passionate temperament, such as might exist in a sane man; and it is only when the history of the case is taken into consideration and collated with the irregularity of passionate outbursts, and with the inadequacy of the provocation which calls it forth, and with the results in action, that a true conception of its nature can be arrived at. It is of the utmost importance to compare the natural history of such cases with that of those forms of mental disease which are manifestly associated with bodily disease; for by so doing the conclusion forces itself on the observer, that in every case where the existence of insanity of any kind can be proved, the outbreaks of passion and irritability belong to an essentially different category to that under which manifestations of passion in the sane are ranged.

The cases in which the tendency to action is most perplexing are those which are generally spoken of as morbid impulse. Numerous cases are on record which have to some extent influenced the popular conception of insanity, in which the leading or even sole characteristic is asserted to consist in the impulse to commit some particular criminal act. These cases have been held to constitute definite forms of insanity, either under the general title of moral insanity, or under the particular names of homicidal and suicidal mania, kleptomania, pyromania, erotomania, and satyriasis. The majority of the cases which pass under these loose terms belong to different and perfectly well-known types. Many impulsive homicides have been committed in epileptic paroxysms or in outbreaks of insane passion; others may be traced to delusions which may not be obvious to superficial examination. Chronic dements and general paralytics are often observed to steal and hoard useless articles. Most suicides are due to states of depressed feeling, either with or without delusions.

It must, however, be borne in mind that suicide is not necessarily an insane act. It may result from a logical process. A man having discovered that he is the subject of a fatal disease, involving in its course long-continued pain and misery, destroys himself after thoughtfully setting his house in order. The act may be immoral and opposed to the dictates of religion, but it cannot be regarded as an insane action. Although an element of morbidity may enter into *tædium vitæ*, escape from it by suicide is not an irrational act; in proof of which we may cite the case of a man suffering from weariness who promised to delay taking his life until he had reconsidered the position. He fulfilled his promise, and then shot himself. It is needless to draw attention to the many historical cases in which suicide was regarded as a duty, and as consonant with the religion of the individual. Many such instances are frequently included in the verdict of the coroner's jury—"Suicide committed under temporary insanity."

A large number of the acts which have been ranged under special criminal manias have simply been committed by persons of weak intelligence and excitable character, yielding to passing impulses or suggestions which they were not strong enough to resist. But, putting aside these as belonging to recognised types of insanity, there are left a certain number of cases in which no overt symptom of insanity exists apart from the act itself, and in which the act seems best described as due to an impulse and nothing more. The mere conception of the act seems to work its own fulfilment, in some instances without motive or feeling, sometimes apparently in spite of conscious resistance.

Very few cases of morbid impulse being pleaded in defence of crimes committed by persons who showed no definite indication of insanity, apart from the act itself, are recorded, and these, speaking generally, are not of a satisfactory character. Nevertheless, we cannot wholly deny the possibility of their existence. There does not appear to be anything improbable in the theory that, in certain occult morbid nerve conditions, the mind may be stimulated to action by certain ideas in a manner which is quite exceptional. We know that this takes place in cases in which the existence of disease has been established, and less prominent phenomena of the same kind have often been observed in health. We cannot, therefore, altogether reject the possibility of such cases; but they are open to such very grave suspicion, that evidence of their existence can only be received with strict reserve. In point of fact, there is scarcely a recorded case in which the plea of morbid impulse has been accepted in a court, unless some proof of general insanity had been adduced.

The extent to which the mind is affected by insanity differs, of course, enormously in different cases. Every one is familiar with the wide variations presented by cases of intellectual defect, ranging between absolute idiocy and shades of imbecility which can scarcely be distinguished from ordinary stupidity. In every form of mental symptom we find similar variations of intensity. Morbid states of feeling, although always reaching a certain pitch of intensity in each case, differ as much from each other, over all, as ordinary states of pain or excitement. Conditions of irritability may exhibit themselves in forms which can scarcely be distinguished from an ordinary fit of passion. In some cases we cannot discover the slightest trace of voluntary effort to suppress it, while in others we can see that an insane motive is consciously and sometimes successfully resisted. In short, at every point at which the mind is either weakened or excited by morbid conditions, the effect produced may vary indefinitely; and therefore, when we attempt to ascertain the mental condition of a given case with any accuracy, we are confronted not merely by the difficulty of tracing the different elements, but by a complicated question of degree.

The intensity of symptoms varies not merely in different cases, but at different times in the same case. External circumstances often produce great effect in the direction of intensification or reduction. Influence in the direction of reduction of intensity of symptoms is illustrated by the fact that in those chronic cases in which any power of control remains, the exercise of authority and discipline makes itself felt distinctly. There are very few lunatics who lose entirely the power of controlling themselves. Were it not so, the administration of asylums would be impossible, except under conditions much more rigid than now obtain.

In the older cases we find considerable importance attached to lucid intervals, during the persistence of which the mind was supposed to recover its sanity entirely. A lunatic was sometimes defined as one who enjoys lucid intervals, in opposition to one who, like the idiot, labours under a perpetual infirmity. The phrase is founded on the old view of insanity, which never admitted that a man was mad unless when he was showing patent marks of derangement. It was assumed, especially in criminal cases, that insanity only existed during transient phases of excitement, and that the intervals were to be regarded as states of sanity. In fact, such a supposition is only admissible in a limited number of cases.

There is a condition spoken of as *folie circulaire*, in which insanity appears in the shape of intermittent attacks, having some resemblance to the phenomena of gout or neuralgia. In such cases, to all outward appearance, the subject seems to be sane during the intervals, and in fact is so to the extent that he retains the power of relation. He may be able to exercise his civil capacities, but almost any criminal act he may commit must be related with the underlying morbid condition productive of the periods of marked insanity.

When the underlying morbid physical conditions are continuous, as they are in the majority of cases, the mental symptoms are persistent. They may indeed present remissions like other symptoms of disease, but it cannot be assumed that, because the symptoms have temporarily abated, the mind has regained its former state of sanity. Such temporary remissions demand attention, because in certain cases, when the intellect is not seriously disordered, the possibility must be admitted that a mere decrease in the intensity of the morbid symptoms may render the mind capable of intelligent action; but they must always be regarded with suspicion, and must never be permitted to affect judgment unless there is positive evidence at the time that the mind was capable of performing a particular act intelligently.

Temporary exacerbations in the intensity of symptoms are marked phenomena in insanity. They may vary in accordance with the progress or arrest of morbid processes; sharp crises may, as in every nervous disorder, occur periodically. In women, mental symptoms often become aggravated at the menstrual periods. In many chronic cases the ordinary mental condition is interrupted by intercurrent acute attacks of excitement or depression. Even in cases in which an attack of insanity has left no sequelæ beyond general dulness of the faculties, there is often a sudden unexplained return of excitement. It is thus always possible that, apart from the influence of external circumstances and exciting lines of thought, the condition of an insane person some time after the commission of an act, is no criterion whatever of his state at the time it was committed.

The question continually arises, both in theory and in legal practice, whether insanity is not occasionally limited in its operation to a single mental function or to a particular set of ideas. There are many cases which at first sight seem to lead naturally to this conclusion. Certain lunatics appear to converse rationally on everything except certain subjects. Cases have occurred in which it was impossible to elicit evidence of insanity except by adopting a particular line of examination, and it has occasionally happened that even such special line of inquiry has proved insufficient when the lunatic became aware that, if he followed it, he might be led into making dangerous admissions. It has often been supposed that in such cases the insanity is limited to the relation in which the mind stands to particular ideas and that in other respects it is wholly sane. Whether a limitation like this is possible or not, we know far too little of the nature of the mental phenomena and their relation to the brain to determine with certainty. We must be content with conclusions which are nothing more than the general result of experience. Nevertheless, we find theoretical assumptions of this kind forming the turning point of legal decisions. The possibility of an entire separation between sane and insane mental elements is assumed in extreme views of monomania and in the answers of the judges in Macnaghten's case; while, on the other hand, a case which was for some time a leading authority in the law of wills was decided on the ground of the perfect unity of the mind.

There is ground for supposing that only one mental function may be primarily affected. During the prodromal stage of a large proportion of cases, no mental symptom of disease may be discoverable, except a morbid state of feeling; but so far as our experience goes, the other faculties become concurrently affected in a short space of time. The different mental functions are so intimately related, that it is impossible to conceive the possibility of one of them being seriously affected without implication of the action of the others. While, therefore, it may be admitted that the direct action of disease may be limited to the production of morbid states of feeling and emotion, as an initial symptom of insanity, there must be taken into account not merely the immediate effect of these morbid states, but the influence which they exert upon other functions by their abnormal intensity and persistence.

The question suggested by the term partial insanity is whether it is possible that the mind should only be insane when occupied with certain ideas,—whether, in the old phrase of the law, it is possible for a man *quoad hoc nil illud insanire.* If attention were confined to consideration of the extreme recorded cases only, the conclusion might be arrived at that such a case was possible though certainly very rare; but when we take a more general view of the subject, we find that presumptions are strongly against it. In some of the most common forms of insanity, although the mind is affected generally, the insanity exhibits itself most conspicuously in relation to a certain set of ideas which are either constantly before the mind, or which seem to exercise a special influence over it. Although, as we have said, people are apt to mistake these ideas for the cause of the mental disturbance, yet in reality they are only secondary symptoms. They do not appear independently at the commencement of the disease, but are always preceded or accompanied by some more general form of mental disorder; nor is there any relation between the intensity of the general affection and the greater or less number of these ideas. Limitation and concentration of ideas is best marked in aggravated cases. In certain melancholics, prominent false ideas are connected with certain subjects, while in others, if we can get the mind to attend to them, scarcely any further sign of disorder is manifest. In such cases the mental affection is not really partial, though it may appear to be so. The mind is affected generally by the morbid state of feeling, and the special delusions are simply the ideas through which it most readily finds expression. Delusions may change as new ideas suggest themselves, or they may continue to run in one track, as if an idea had obtained, by constant recurrence, a permanent hold over the mind. In the chronic stages, in which we find the greatest number of so-called monomaniacs, the special delusions are equally dependent on general morbid conditions. So long as the morbid excitement continues we may find new delusions arising. When, as in the case of many demented patients, the general excitement has entirely ceased, we find permanent delusions, which have originated during the active stages of the disease, and have obtained too firm a hold upon the mind to be expelled by its enfeebled power. In cases where delusions or fixed ideas appear gradually in the mind, without any apparent preceding phase of acute insanity, symptoms of a general morbid excitability can usually be detected, rendering it more than possible that the effect of almost any mental stimulus may act abnormally both in intensity and persistence. In short, in every case of insanity in which certain ideas become prominent or exercise abnormal influence, we trace their peculiar position (with perhaps a few apparent exceptions), not to a cause which specially affects their relation to the mind, but to general morbid conditions out of which they are developed in a manner analogous to the peculiarities of character in sane life. Many men are subject to eccentricities of thought or action, or are liable to be excited by some peculiar subject; but it is never supposed that these peculiarities spring from some cause having no relation to the rest of the character. On the contrary, they are traceable to some general weakness or excitability, and the peculiar limited directions which they take are determined by accidental circumstances. So also, when the mind is affected by some morbid influence, the effect may appear conspicuously in some particular direction; but the direction must not be mistaken for the starting point, nor can its power of expansion be limited.

Although, therefore, there are certain reported cases in which the affection appears to have been partial, our experience inclines us to believe that the symptoms of the more general affection have been suppressed or overlooked, rather than that a few isolated instances have been entirely different in their nature from all others which have been thoroughly examined. From our point of view the existence of a true monomania is improbable, if not impossible.

VARIATION IN ITS RELATION TO THE ORIGIN OF INSANITY AND THE ALLIED NEUROSES.[1]

By JOHN MACPHERSON, M.D., F.R.C.P.Ed., *Commissioner of Lunacy in Scotland.*

LECTURE I.

INTRODUCTION.—In the following lectures, which I have had the honour to be asked to deliver before this College, I propose to deal with an aspect of mental affection which has not hitherto been much considered. Except in so far as they bear upon my argument, I shall not deal with clinical or pathological details, and I trust that the absence of these important subjects may not be regarded as a serious defect.

If a number of individuals of any species be compared, it will be found that they all show differences from each other in size, shape, and colour, and if they be animals, in their mental characteristics. Offspring differ from their parents, brothers from brothers, and sisters and brothers from one another. These differences constitute what is known as "variation," and it is upon variation that the evolution of organic life—apart from its primary cause—essentially depends. My task is to attempt to prove to you that variation can explain most of these phenomena which we regard as mental defect, and that it explains, in part at any rate, many of the manifestations of mental disease. Variation and heredity are intimately connected with one another; they are, so far from being opposed, really one and the same thing. Perhaps no more unfortunate term than "heredity" has ever been employed in scientific language. It is based upon the analogy of the descent of property, and it implies that parents hand down to offspring certain characteristics which essentially belong to themselves. In a sense this may be true, in another sense it is misleading and false. To take a concrete example. If a father has dark eyes and his son has dark eyes, we say that the boy has his father's eyes—that is so; but when we say that the son has *inherited* his father's eyes, we often mean loosely that it is *because* the father had eyes of a certain colour that the son also has them. We might as well say that as the boy's sister has dark eyes he has inherited them from her. The boy has inherited his dark eyes from the same source as his father and sister, namely, from the stock from which they all spring. In other words, the line of descent is not through the parental body at all, but through the germ cells. From the suggestion that the body of the parent is in some way remodelled into that of the offspring, a whole series of errors are derived, which result in inevitable confusion of thought. To quote Galton:[1] "It appears that there is no direct hereditary relation between the personal parents and the personal child, except perhaps through little known channels of secondary importance, but that the main line of hereditary connection unites the sets of elements out of which the personal parents had been evolved. The main line may be rudely likened to the chain of a necklace, and the personalities to pendants attached to its links." It will be helpful, then, if for the present we drop the metaphor of property which is implied in the use of the term "heredity," and attempt to account for the phenomena of variation on the assumption that the germ cells alone are the bearers of the quality of what, for want of a better term, we must continue to call "heredity."

---

[1] "The Morison Lectures," delivered before the Royal College of Physicians, Edinburgh.

First of all, I shall deal as briefly as possible with the subject of the mechanism of variation, for it must be admitted by all that insanity in the gross is a variation, an abnormality, a departure from the ordinary mode of human life; and this statement will be generally admitted without prejudice either to the form of variation or the stage at which it takes place.

VARIATION—WHAT IT IS.—An amœba reproduces by simply dividing into two. As Milnes Marshall quaintly puts it: "If the original amœba be called Tom and the products of fission Dick and Harry, the upshot of the process may be expressed by saying that Tom has disappeared without having died, while Dick and Harry have come into existence without having been born."[2] Hence arises the idea of the immortality of the Protozoa. According to a distinguished embryologist, Dr. John Beard of this University, the process of fusion and subsequent fission among the Infusoria is much more complicated than it at first sight appears. After conjugation, the resulting organism divides into two and again into two without resting. Four nuclei arise, one in each cell. These two pairs of nuclei rapidly acquire different appearances: one pair becomes large and rounded, the other remains small, and later on disappears. The process is without question a spore formation or larval stage. Two of the spores are abortive, the other two go to form the new individual.

According to Beard, a similar process takes place in the higher animals, including probably man. The union of the spermatozoon and ovum to form a zygote is succeeded by a definite larval stage. From one of the cells of the larva arises the primitive germ cell. The primitive germ cell in turn divides into separate groups of cells known as the primary germ cells. From one of these primary germ cells of a separate group, the embryo springs. From another of a separate group, the sexual cells of the new individual spring. We have now reached the stage in which we perceive that one of the primary germ cells has, so to speak, sacrificed itself to form the embryo. It has left the path of regular descent. At a certain stage—in man before the end of the second month of intra-uterine life, in other mammals at varying periods—the embryo unfolds itself and receives into its cavity the sexual cells. At this period sex is determined, and for other reasons, as we shall see further on, the period is critical in mammalian development. From the sexual cells thus received by the embryo the individuals of the next generation are formed.

---

[1] "Nat. Inheritance," p. 19.

[2] "Biological Lectures and Addresses," p. 273.

The researches of Beard and others enable us to perceive, in a more or less graphic manner, what Weismann taught theoretically, that the line of descent is not through the embyro, but through the sexual cells. It was from an appreciation of this fact that Weismann taught the doctrine of the immortality of the germ plasm. Of course the reproductive cells can be destroyed just as the amœbæ are destroyed in incalculable numbers, but in one sense neither die naturally. The reproductive cells of the Metazoa are therefore immortal in exactly the same sense as are those of the Protozoa. Among the higher animals the reproductive cell is technically termed a gamete. The mobile male reproductive gamete is known as the spermatozoon, the less mobile female one as the ovum. The difference in form between these two gametes is a matter of secondary importance, and is connected with the primary function of fusing or coming into contact. This fusing results in the formation of a uninucleated cell, technically termed the zygote.

The zygote contains elements of the male and female parents which Weismann terms "determinants." In order that these elements may be properly proportioned, the zygote is subjected to what is known as the process of reducing division, which is carried on both longitudinally and transversely, until the zygote retains just that proportion of elements which is necessary for the development of the embryo. What is not required is extruded for another purpose. This is the larval stage of Beard,—the reducing division of Weismann and the point at which the primitive germ cell divides to form the two essential groups of primary cells.

The primary result of this reducing division of the zygote is the different proportioning for each individual of the paternal and maternal characters. We cannot discover until well on in developmental life how the characters of the two parents are distributed in the offspring, and then we know from experience how diversely each child inherits ancestral characters. Even children of the same family differ greatly in this respect, and though such differences have sometimes been erroneously attributed to changes in the parental life between the birth of the eldest and the youngest child of a large family, similar differences in members of the same litter, say of dogs or pigs, are sufficient to prove beyond dispute that this variation is a general accompaniment of sexual reproduction. We have seen now that the zygote is formed by the combination of two distinct and separate cells, and that it is therefore essentially a new individual, the characters of which are and will be different from those of both parents. We have also seen that the zygote is subjected to a reducing division, which results in a further proportioning of the parental characters. The resulting individual, therefore, differs, from its parents, and this difference is known as Genetic Variation. This difference manifests itself in differences of habit, constitution, form, and structure, hair colour, eye colour, intelligence, longevity, and resistance to disease. Of other causes of variation, next to nothing is definitely known.

Bateson[1] states: "Inquiry into the causes of variation is as yet, in my judgment, premature." In his presidential address to the Section of Zoology of the British Association in 1899, Professor Sedgwick says: "(1) A change in conditions cannot affect the next generation, unless the reproductive organs are affected. (2) From a consideration of the facts of the case, it is almost inconceivable that the effect produced upon any organ of a given organism, by a change of conditions, should so modify the reproductive organs of that organism as to lead to a corresponding modification in the offspring, without the latter being exposed to the same conditions. (3) The only effects which are certainly known of changed conditions upon the reproductive organs are the production of sterility and an increase in genetic variation." Professor Cossar Ewart, in his presidential address to the Section of Zoölogy of the British Association in 1901, gives expression to the belief that "there is a considerable amount of evidence in support of the view that changes in any part of the body which affect the general welfare influence the germ cells"; but he goes on to make the following important qualification: "While the germ cells are liable to suffer when the soma is the subject of disease, there is no evidence that they are capable of being so influenced that they transmit definite or particular variations." But there is something more than this. What it is, is difficult to understand, and consequently difficult to express, but I think Professor Karl Pearson comes nearest it when he says, "Variability is not a product (only) of bi-parental inheritance. The individual contains in itself, owing to a bathmic law of growth, a variability which is quite sensible, being 80 to 90 per cent. of the variability of the race. . . . I think there is quantitative evidence that types of life may change without the action of the organic or inorganic environment, *i.e.*, solely owing to something inherent in their constitution."[2]

The above, so far as known to me, are the most authoritative and most generally accepted views at the present time regarding the origin and causes of variation. Variation, then, is innate in the germ plasm; it may be made manifest in the individual under the developing influence of the environment; but, as Professor Sedgwick puts it, in the address quoted from, "it is clear that in no case can the external conditions call out properties with which the individual was not endowed at the act of conjugation." I desire to emphasise this fact, because I believe that upon it depends the rectification of much of the misconception with which the subject has hitherto been darkened.

---

[1] "Materials for the Study of Variation," p. 78.

[2] "Grammar of Science," pp. 376 and 473.

THE EXTENT OF VARIATION.—When I say that variation is the rule and not the exception, I mean that, so far as we know life on this planet, offspring not only vary from their parents to a greater or less degree, but that the offspring of the same parents vary from one another to a greater or less degree. "Any one who would gain some idea of such measures of type and variability, and the influence upon them of environment, has only to count in some hundreds of individual cases, the petals or florets of some simple wild flower, and observe the differences which occur."[1] The variability of plants is notorious, not only when grown and cultivated for domestic use, but when living in a state of wild nature. To take a few common British examples. There are no less than twenty-eight varieties of the common dog-rose, distinguished by more or less constant characters, and often confined to special localities. The varieties of the common bramble range from five to forty-five, according to the opinion of botanists as to what constitutes a true variety. In the same way with the willow, the species or varieties oscillate between fifteen and thirty-one.

It is a common but wholly erroneous opinion, that animals in a state of nature vary very little, and that to observe variation one must turn to domestic animals. It would be impossible to attempt to give the proofs here of the variability of wild animals.

Bateson[2] conclusively shows that, while certain species tend to vary abnormally more than others, there is no reason to suppose that variation is less common among wild animals. Frequency of extra teeth are certainly more common in domestic cats and dogs than among their wild congeners, but they are not more so than among the higher apes and seals. It is also shown that the frequency of digital variation is greater in the cat, pig, fowl, and pheasant, but rare in the dog, sheep, and most birds.

The horse shows many digital variations, the ass none at all.

We may then conclude that there is hardly an organ or a quality in plants or animals which has not been observed to vary; and, further, that whenever any of these variations has been useful to man, he has been able to increase them to a marvellous extent by the simple process of always preserving the best varieties to breed from.

---

[1] Professor Pearson, "Grammar of Science," p. 388.

[2] "Materials for the Study of Variations."

THE MEASUREMENT OF VARIATION.—It is not sufficient to say that any particular individual varies from the normal or that any particular organ varies extremely from other similar organs, for so much depends upon what each observer means by normal and upon what he means by variation. But supposing it is asserted that out of a large number of individuals, 5 per cent. varied, plus or minus, from the average of the whole, there is then afforded a numerical expression of the degree of variation, which can readily be compared with other expressions of a similar kind. I am here reminded that a distinguished professor of medicine in this University, upwards of forty years ago, urged upon his students the adoption in their work of what he termed the numerical method, including the use of the calculus of probabilities. Unfortunately the Edinburgh School has discarded Laycock's teaching in this as in other directions, but it is an extraordinary testimony to Laycock's genius, that at the present day biological science should be adopting this method which he so long ago commended.

I take from the report of the Anthropometric Committee of the British Association for 1883, the following result of the survey of stature of 6194 English adult males taken at random:—

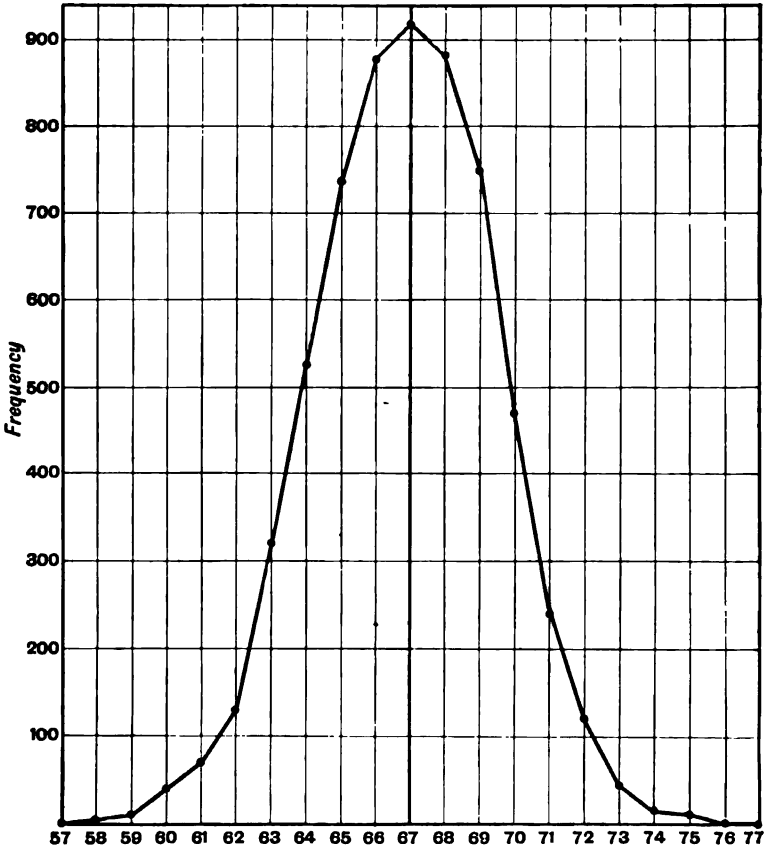
TABLE I.—*Stature of* 6194 *English Adult Males.*

Height in Inches .	57	58	59	60	61	62	63	64	65	66
Frequency . .	1	3	12	39	70	128	320	524	740	881

Height in Inches .	67	68	69	70	71	72	73	74	75	76	77
Frequency . .	918	886	753	473	254	117	48	16	9	1	1

We now reach the conception of race type. The *mode, i.e.* the greatest frequency of stature for English males, is 67 in. The mean is also 67 in. We find that the most common—that is, the most normal—individuals are grouped near the mode or mean, and as we proceed further to either extreme (to plus or minus), the frequency becomes less. Now the measure of the deviation of each group (plus or minus from the mean) is found by simply subtracting it from the mean; and from the sum of the squares of all these deviations, multiplied by their frequency and divided by the total number of individuals, we obtain what is known as their standard deviation from the mean. The whole theory of variation falls under the mathematical theory of chance. Thus, what is the chance that an individual picked at random will be less than 65 in. high? There are 1097 such individuals in the preceding table, or 18 per cent.; the odds are therefore 9 to 2 against the randomly selected individual being so short.

In order to find whether such a distribution of stature is natural or normal, *i.e.* whether it is according to the laws of chance or the calculus of probability, we cast it into the form of a chart or a polygon of frequency, and we get the following curve:—



Stature in inches of 6194 English Adult Males.

If we were to take any other character—such as eye colour, strength, weight—we could easily construct a similar curve, and find out the normal racial type for each character.

Without enlarging upon the many interesting peculiarities of the curve, it may be again pointed out that the typical height is 5 ft. 7 in.; that the great majority of observed individuals group themselves around this mean stature; and that the units become fewer and fewer as we proceed towards either extremity. We may therefore safely assume that the individuals around the mean are more normal than those at the extremities. Are those at the extremities then abnormal? Not necessarily so as regards the stature of a comparatively small number.

But if instead of 6000 individuals we take 6,000,000, and treat them in exactly the same way, we should enlarge the capacity of the curve.

The mean might not vary much, but at the extremities we could undoubtedly find on the one hand pathological dwarfism, and on the other hand pathological gigantism. We are thus led irresistibly to the conclusion that so far as regards the frequency in the population of stature, and many other measurable characters besides, the normal shades insensibly and by a gradual curve into the abnormal. The paucity of the more infrequent members which compose such a curve is due to two factors—(1) The law of genetic selection, and (2) the law of regression.

GENETIC SELECTION.—We owe the discovery of the law of genetic selection to Professor Karl Pearson. While collecting the seed of various plants for another purpose, he found the following frequency for the stigmatic bands on capsules of *Nigella Hispanica.*

TABLE II.—*Nigella Capsules.*

No. of segments .	2	3	4	5	6	7	8	9	10	11
Frequency . .	10	7	20	303	412	534	1552	223	59	35
No. of segments .	12	13	14	15	16	17	18	19	20	...
Frequency . .	43	6	...	...	6	...	...	...	2	...

To his surprise, he found that the 8 capsules were highly fertile, but in 10, 11, or 12 capsules he could hardly find any seed at all; 6's and 7's were only moderately fertile, and those with 5 and fewer segments were practically sterile. Both in poppy and *Nigella*, deformed and abnormal capsules were absolutely or relatively unfertile.

These facts, with others, serve to illustrate the following important law:—"Fertility is not uniformly distributed among all individuals, but for stable races there is a strong tendency for the character of maximum fertility to become one with the character which is the type." It has further been proved by statistics, in the case of man, that less than a quarter of one generation, by reason of their fertility, produce more than half of the next generation. If, then, as we have seen, the most typical members of a race are the most fertile, the stability of any race is secured by means of this law of genetic fertility. There is thus a constant tendency to keep the race uniform, and to limit the variability in either direction. That is the reason that the most typical members of a race are the most numerous, and that the curve assumes the form which is here presented.

REGRESSION.—There is, however, another reason, for the discovery, of which we are indebted to Mr. Francis Galton. He termed it the "law of regression towards mediocrity." Working from various materials, including man and Basset hounds, Galton found that each parent contributes to its offspring on an average one-fourth of the offspring character—such as stature, colour, weight, strength, etc. etc. (or one-half between them); each grandparent one-sixteenth. By means of his data, Galton was able to show not only that regression towards the mean took place, but to calculate with exactness the actual amount of regression occurring. For this purpose he transmuted the measurable character of the mother into that of the father, and called the average product the mid-parent. The regression of children from the mid-parent towards the mean of the given race was then worked out, and was found for all characters to be about 0·5.

It has now been explained—(1) That on account of the non-fertility of the more exceptional members of a race, the typical characters of a race remain constant; and (2) that on account of the tendency of offspring to regress towards the mean type, the chief characteristics of a race, though constantly varying from generation to generation, retain a uniform formation, as illustrated by any normal curve.

But if children regress throughout nature in a definite ratio, which is represented by 0·5, the same arithmetical formula must also represent the amount of correlation between children and parents, and between brothers and sisters. As a matter of fact, that is so. In other words, the coefficient of regression and the coefficient of correlation are for stable races the same.

The preceding remarks refer to physical characters only. Do mental and moral characters obey the same laws? Two or three months ago I could only have replied, in a general way, that the probability was that they did. In October of last year, however, Professor Karl Pearson, in his Huxley Memorial Lecture, before the Anthropological Institute, has, to my mind, conclusively settled the matter in the affirmative.[1] As he there points out, it was impossible, owing to the absence of reliable and unbiassed information, to compare the psychical characters of children with that of their parents, so he resolved to compare the physical and psychical characters of brothers and brothers, sisters and sisters, and brothers and sisters. Galton pointed out previously that the blood relationship of brothers or sisters to one another is more close, or as is said in Scotch more "sib," to one another than that of parents and children. That is to say, that the correlation is more perfect. Pearson and his co-workers collected the statistics of 12,000 school children between the ages of 10 and 14 years. The schedules were filled in by various school teachers throughout the United Kingdom. The material took five years to collect, and seven years to compare. The argument used is somewhat as follows:—(1) If it can be shown that over a number of physical and psychical characters there is close correlation between children of the same family, it is as sufficient to demonstrate the germinal heredity of these characters as if the correlation for the same characters between parents and offspring were shown. The heredity is through the germ plasm, not through the individual. (2) If the correlation for psychical characters resembles that for physical characters, then psychical characters must be transmitted in exactly the same way as physical characters.

I need not detail the mathematical or arithmetical processes

TABLE III.—*Mental Ability in 2014 School Girls.*

		FIRST SISTER.						
		Quick-Intelligent.	Intelligent.	Slow-Intelligent.	Slow.	Slow-Dull.	Very Dull.	Totals.
SECOND SISTER.	Quick-intelligent	118	111	49·5	14	7	1	300·5
	Intelligent . .	111	326	213	47	10	5	712
	Slow-intelligent	49·5	213	204	99·5	30	9	605
	Slow	14	47	99·5	64	29	7	260·5
	Slow-dull . .	7	10	30	29	22	5	103
	Very dull . .	1	5	9	7	5	6	33
	Totals . .	300·5	712	605	260·5	103	33	2014

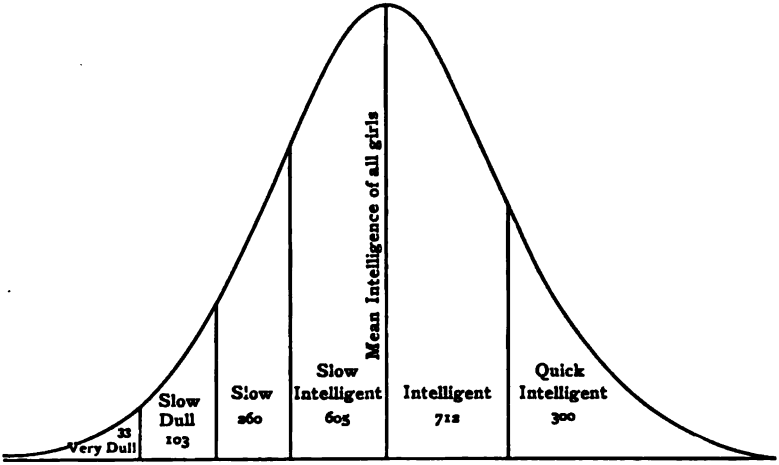
---

[1] "On the Inheritance of the Mental and Moral Characters in Man."

by which his results were obtained, they are to be found in the paper quoted above.

The question to decide is, in what proportion such mental qualities are distributed in the population. We have seen from the curve of stature, which is a good illustration, how that character is distributed. If mental characters are distributed in a similar manner, we have solved the whole problem.

This (preceding) table gives the classified mental ability of 2014 school girls, arranged so as to show the correlation between pairs of sisters. The correlation is a high one, 0·47; but what I wish to point out is the distribution of mental ability. It will be observed that 300 girls were of quick-intelligence; 712 were intelligent; 605 were slow, but intelligent; 260 were slow; 103 were slow and dull; and 33 were very dull. The following curve, prepared by Professor Pearson, illustrates the normal distribution of these mental qualities:—



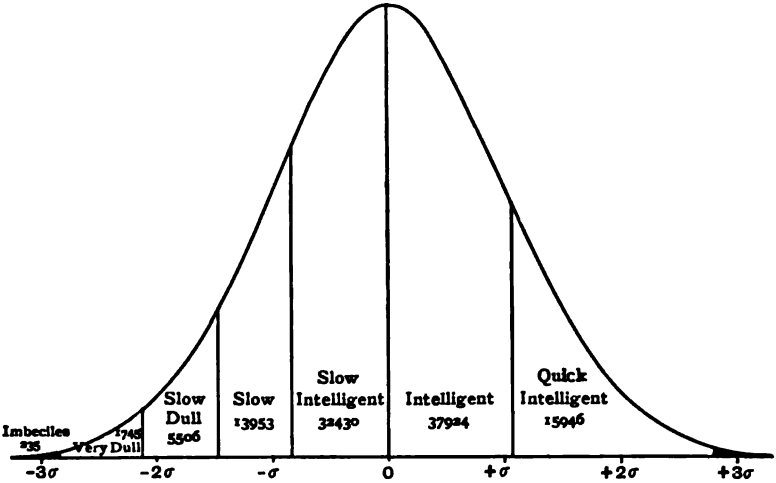
Standard deviation = ·97 range of Intelligent

It will be observed that the mean ability of all the girls is between "intelligent" and "slow-intelligent." The others gradually diminish in frequency as we approach either extremity of the curve to "very dull," or to "quick-intelligent." The resemblance between this curve and that of stature will be present to your memory.

Applying Pearson's methods and proportions to 107,740 Glasgow school children, of whom 235 were last year reported to be idiots, imbeciles, or mentally defective, the curve on the following page will show the normal distribution of mental qualities in these children.

You will observe how small a part the mentally defective children occupy of the area of the curve. We estimate that

1745 are very dull; 5506 slow-dull; 13,953 slow; 32,430 slow but intelligent (now comes the mean, which as formerly is between slow-intelligent and intelligent), 37,924 are intelligent, and 15,946 quick-intelligent. If this curve represents at all nearly the normal distribution of mental qualities in the population, there must be between 200 and 300 children who are quite exceptional in their mental ability.



Suppose these two curves were to refer to any other physical or mental quality—such as pigmentation, weight, or stature, mental ability, or moral sense—they would absolutely follow the same shape, to whatever group of animals they might be applied. We therefore see that they are genetically fixed laws of nature, and that every quality, mental or physical, is distributed in a race, from a minimum possessed by a few individuals, occupying one extremity of the curve, to a maximum possessed also by a few individuals, occupying the opposite extremity; and that the average amount of any quality is possessed by the greatest number of individuals who occupy the centre of the curve, and are grouped around the mean. These most numerous individuals are the most normal, and it is they who form the race type.

A NOTE ON CUTANEOUS TELANGIECTASES AND THEIR ETIOLOGY: COMPARISON WITH THE ETIOLOGY OF HÆMORRHOIDS AND ORDINARY VARICOSE VEINS.

By F. PARKES WEBER, M.D., F.R.C.P., *Physician to the German Hospital, London.*

EVERY doctor is familiar with the hair-like branching lines formed by dilated cutaneous venules, when they are distributed so as to form a girdle round the trunk at a level more or less corresponding with that of the insertion of the diaphragm. Edward Blake, in 1877, described this ring of dilated vessels[1] as the "cingula athletica, a pathognomic sign of pulmonary vesicular emphysema when it occurs in the gouty," and the condition has often been attributed to the increased intrathoracic venous pressure associated with pulmonary emphysema, chronic bronchitis, etc. E. Schweninger[2] described and figured the condition in 1897, and Dr. E. Kingscote[3] finds that it is invariably to be observed in asthmatic patients after middle life in a more or less marked degree. Kingscote has "frequently observed such a zone of congested vessels in the præcordium and hypochondrium in cases of cardiac dilatations and enlargements of the liver and spleen respectively; in fact, whenever there is interference with the blood flow in the azygos veins, owing to pressure by an enlarged viscus." Solis Cohen[4] says he has given the term "costal fringe" to the peculiar telangiectases following the outlines of the costal arches. He has found the "costal fringe" in a patient associated with factitious urticaria, and he says it likewise occurs in some cases of hepatic cirrhosis.

I do not deny that this fringe of telangiectases may be excited by chronic dyspnœa, excessive action of the diaphragm, frequent coughing, and increased intrathoracic venous pressure of any kind, such as arises from chronic bronchitis, emphysema, asthma, whooping-cough, etc. Nor do I deny even that it may occasionally disappear when the exciting cause has been removed. Dr. Symes-Thompson has kindly furnished me with an excellent illustration of this. A man, when about 50 years of age, suffered from whooping-cough, with "acute emphysema." The terminal venules near the costal margins became very manifest, but in the course of about six months they practically disappeared, though later on in life they became slightly dilated again. Kingscote[1] has likewise observed that the zone may become fainter in asthmatic patients under appropriate treatment, and in some cases entirely disappear. What I maintain is that the "costal fringe," like cutaneous telangiectases in other situations, sometimes occurs in the absence of any obvious exciting cause.

---

[1] See the coloured illustration given in his book on "Constipation," second edition, London, 1900.

[2] *Mitth. a. d. dermat. Klin. d. k. Char.-Krankenh. zu Berlin*, 1897, S. 47. I have not been able to see this paper, but it is quoted by Kingscote, "Asthma," London, 1899, p. 78.

[3] "Asthma," London, 1899, p. 78.

[4] "Vasomotor Ataxia," *Am. Journ. Med. Sc.*, Phila., 1894, vol. cvii. p. 135.

Cutaneous telangiectases are, indeed, by no means limited to the costal fringe. They may occur, scattered or in groups, on almost any part of the body. One of the commonest situations is on the back of the thorax, on each side of the spinal column, in the upper interscapular region. In this situation, I think, a few hair-like telangiectases can be found in 50 per cent. of healthy young adults.

A healthy man, æt. 34, whom I examined for life assurance last July, had a remarkable arrangement of telangiectases over the front and sides of his thorax. They formed a rounded arch crossing the sternum at the level of the second intercostal space, and resting on lateral columns of telangiectases on each side of the thorax just outside the nipple lines; the base of each lateral column was formed by a considerable group of telangiectases about the level of the diaphragm, and the central part of the front of the chest was quite free. This man told me that the curious dilated vessels had existed as long ago as he could remember. He likewise had telangiectases on some other parts of his body.

Similar telangiectases are often present on the face, even in young persons, and even in the absence either of special exposure to weather or of frequent flushing of the skin from any cause, such as indulgence in stimulants. The spider-like "stigmata" on the face, etc., consisting of fine hair-like lines radiating from a red central spot, which occur in young persons as well as in alcoholics and patients with cirrhosis of the liver, are, I believe, merely a variety of these telangiectases, towards which alcoholism acts as a predisposing cause in some cases. Crocker says that such stellate telangiectases form part of the symptomatology of xerodermia pigmentosa.

Cutaneous telangiectases of a reddish or bluish colour are fairly common in the lower extremities, and are often associated with ordinary varicose veins. Symmetrical groups of such telangiectases are frequently to be observed in the outer parts of the thighs and above the patellæ. Often some of the telangiectases on the thighs are larger than telangiectases in other situations; all sizes of dilated veins occur on the outer part of the thighs, from hair-like telangiectases up to the size of ordinary varicose veins (external femoral set of varicose veins).

In 1901, I saw an anæmic and cachectic girl, æt. 15, on whose pale face the dilated terminations of cutaneous venules were very conspicuous. She had similar telangiectases on the right leg. It may be just worth while mentioning that a subsequent post-mortem examination in this case showed the presence of some perihepatitis and scarring of the liver; for congenital syphilis, according to E. Fournier,[1] has in some cases been associated with remarkable dilatation of superficial veins in the head.

---

[1] *Loc. cit.*, p. 78.

As to etiologly, I regard the formation of all cutaneous telangiectases as to some extent allied to nævus-formation (angioma). Telangiectases of the skin may arise, like minute cutaneous nævi, at any period of life and in the absence of any obvious exciting cause, though their development may, like that of minute nævi, be encouraged by some cachectic condition of the body. Thus, alcoholism and cirrhosis of the liver predispose to cutaneous telangiectases, and a senile condition of the skin predisposes to minute cutaneous nævi.[2] Cutaneous telangiectases, however, unlike nævi, are frequently induced by obvious exciting causes. Thus, in the lower extremities at least, increased pressure in the veins must be admitted as an exciting cause of cutaneous telangiectases, just as it must of the ordinary varicose veins. In regard to the "costal fringe" of telangiectases, we have already alluded to factors which must be admitted as exciting causes in some cases. In the face, exposure to rough weather often induces telangiectases, and a frequent connection between local hyperæmia (frequent flushing from dyspepsia, alcoholic indulgence, etc.) and telangiectases of the nose is universally acknowledged. The spider-like kind of telangiectasis in patients with hepatic cirrhosis, etc., seems often to be induced by a small inflammatory papule in the skin.

In short, I would say for cutaneous telangiectases, as for hæmorrhoids and ordinary varicose veins, that although exciting causes are often present, they are often apparently absent. Predisposition varies so much, that telangiectases may occur in the skin of some young persons in the absence of any recognisable cause, or from some trivial cause, such as friction from the clothes; and in other persons facial telangiectases may fail to develop in spite of frequent flushing and considerable exposure of the face to rough weather.

I now come to the comparison of the development of cutaneous telangiectases with that of hæmorrhoids and ordinary varicose veins. Though passive congestion in the portal system (from any of its numerous causes) and overfeeding (and general functional over-activity of the alimentary canal), as well as local irritation[1] from chronic constipation, inflammation of the mucous membrane of the rectum, etc., are admitted exciting causes of hæmorrhoids, they do not sufficiently account for their occurrence in all cases, especially in very young patients. What, however, may be termed the "new formation" or "angioma" theory of G. Reinbach[2] is sufficient to explain the peculiar disposition of some persons to develop hæmorrhoids, even when special exciting causes are apparently absent.

---

[1] "Des Dystrophies Veineuses de l'Hérédo-Syphilis," *Rev. d'hyg. et de méd. infant.*, Paris, 1902, tome i. p. 26.

[2] The abundant presence of minute cutaneous nævi has by some been supposed to be of importance in the diagnosis of internal cancers, but this view has, I believe, already been quite given up.

Similarly, in regard to ordinary varicose veins of the lower extremities, although venous pressure and inflammatory conditions are probably the usual exciting causes, a peculiar, sometimes hereditary, tendency towards varicose veins must be admitted in many cases. In extreme examples, indeed, varicose veins may be congenital, or almost congenital, and definitely associated with nævus-formation in the affected extremity.[3]

THE STOOLS OF DYSENTERY AND THE PROGNOSTIC INDICATIONS DERIVABLE FROM THEM.

By ANDREW DUNCAN, M.D., B.S. (Lond.), M.R.C.P., F.R.C.S.,
Physician to Seamen's Hospital Society and to the Westminster General Dispensary; Joint Lecturer on Tropical Medicine at the London School of Tropical Medicine.

MUCH information can be gained from an inspection of the stools in dysentery, both with reference to the extent of the process going on in the intestinal canal, and also as regards the prognosis of the case. The dysenteric stool should always be seen by the physician at his visit to the patient, and the best method of preparing them for inspection is that practised at the General Hospital, Calcutta, instituted by Dr. Goodeve, a good account of which appeared in this *Journal* for 1900, vol. vii., by Colonel Macleod, Professor of Tropical Medicine at the Army Medical School, to which the reader is referred. The article in question is well worth studying.

---

[1] On local inflammatory conditions as causes of hæmorrhoids, see Quénu, "Étude sur les Hémorrhoïdes," *Rev. de chir.*, Paris, 1893, tome xiii. p. 200.

[2] "Path.-anat. u. klin. Beitr. z. Lehre von den Hämorrhoïden," *Beitr. z. klin. Chir.*, Tübingen, 1897, Bd. 19, S. 1; and "Hämorrhoïden im Kindesalter," *Mitth. a. d. Grenzgeb. d. Med. u. Chir.*, Jena, 1903, Bd. xii. S. 272.

[3] Examples of this are to be found in some of the published cases of overgrowth of an extremity, associated with, and possibly dependent on, developmental overgrowth of the blood vessels of the part, such as Roxburgh's case in a child æt. 5 years (*Rep. Soc. for Study Dis. in Children*, London, 1902, vol. ii. p. 222), and Kellock's case in a child æt. 8 years (*Trans. Clin. Soc. London*, 1903, vol. 36, p. 254). In regard to the view that varicose veins are venous overgrowths, allied to venous angiomata, see Mr. A. Pearce Gould's Lettsomian Lectures in *Trans. Med. Soc. London*, 1902, vol. xxv., p. 132.

The following varieties of stools may occur in dysentery:—

1. *The stool of the milder forms.*—Here first of all a solid motion may be passed covered more or less with greyish or colourless mucus. This is succeeded by the passage of small quantities of offensive mucus, with minute fæcal lumps. Then there are passed mainly small quantities of mucus stained with fæcal matter, and often mixed with blood. And, withal, occasionally scybala are passed at intervals.

2. *In a more severe form.*—After the bowel has discharged its contents, often solid, we find whitish or coloured jelly-like mucus, quickly becoming bloody, with often pretty large quantities of clotted blood. The motions are frequent and of about two to three drachms in quantity. This, *the mucous or muco-sanguineous stool*, forms a slightly yellowish, glaring, quivering mass lying in balls or clumps, without any fæces, or perchance around a formed mass of fæces. If the discharge be very fluid, the masses of mucus unfold into hyaline shreds.

3. *The sanguineo-purulent stool.*—Here in a small amount of yellow fluid, generally without fæces, float a number of reddish lumps as large as a pea or bean, in appearance resembling raw meat. Pieces of mucous membrane can at times be found in this variety of stool.

4. *The purely bloody stool* results either from superficial or deep ulceration.

5. *The simple purulent stool.*—This results from the formation either of submucous abscesses, or from the mucous membrane being destroyed. The pus is either pure and odourless, or mixed with fæcal matter and blood.

6. *The so-called frog's egg stool*, consisting of clumps of tough mucus. Virchow holds this form may sometimes arise from the ingestion of starch food. Another view is that the mucus which has been secreted late in the disease, is pressed into the cavities out of which the follicles have fallen, and then subsequently falls out again into the cavity of the bowel, retaining the shape into which it has been moulded in these follicular cavities.

7. *The pulpy stool*, described by Sir Joseph Fayrer, is very offensive, occurring without blood or mucus.

8. Sometimes we find, *with the ordinary stool of dysentery*, that from time to time the patient will pass throughout the course of the affection, *fluid fæcal matter.*

9. *The gangrenous stool.*—Here a blackish or blackish-red fluid is passed, with a horribly putrescent penetrating odour, containing pieces of gangrenous tissue. Tubular structures may be found in the discharge, which by some are held to be separated portions of the intestinal wall. Heubner, however, holds that they consist only of mucus.

10. *The stools of amœbic dysentery.*—For some time I hesitated to think that such a disease as "amœbic" dysentery existed in

India. For I had never seen any dysenteric disease in the Punjab or United Provinces—the parts of India I had served in—corresponding to the description of the form of the disease given by writers, and, moreover, I had found amœbæ in the stools of patients whose symptoms in no wise differed from those of the usual type of dysentery met with in my hospital. Captain Leonard Rogers, I.M.S., however, in a masterly paper read at the annual meeting of the British Medical Association at Manchester in 1902, effectually proved the existence of this variety of dysentery for Bengal. That at any rate it does not commonly occur in the Upper Provinces of India, can be surmised from the large experience of Major Buchanan, I.M.S., who had not met with the cases described by Rogers, so that to designate "tropical dysentery" as synonymous in all cases with "amœbic" dysentery is not correct. "Amœbic" dysentery is but one form of dysentery met with in the Tropics, and moreover amœbæ are found in the stools of patients suffering from dysentery, the symptoms of which do not conform to those laid down as the classical ones of this variety of the disease. The stools of the amœbic dysentery described by Councilman and Lafleur, in their paper in the *Johns Hopkins Reports* for 1891, are mucoid, with purulent greyish shreddy material; greenish like spinach, or pultaceous, with occasionally large necrotic masses; dark brownish and liquid, floating in which are greyish-white masses of the size of a pinhead, embedded in blood and stained mucus. They are far more liquid than the ordinary stool of dysentery. The amœbæ are best found in the small greyish-white gelatinous masses.

11. *The stools of chronic dysentery.*—These vary much in character. They are thin, watery, of varying colour, and may be very offensive. Mucus, blood, and pus are mixed in different combination. Sometimes the blood is so intimately mixed that the whole stool is of a brownish or darkish colour.

We will now consider some of the indications obtainable from the different appearances of the stools in dysentery as regards *prognosis.*

(1) *A good result* can be foreshadowed in those cases in which are passed mucus with minute fæcal lumps, stained or not with blood, and in which the blood and mucus disappear; the ordinary fæcal characters will soon manifest themselves.

(2) *The prognosis* is of evil omen.—(*a*) According to Sir Joseph Fayrer, in the cases in which pulpy stools without blood or mucus are passed; (*b*) where fluid fæcal matter is from time to time passed throughout the illness, the prognosis is unfavourable, inasmuch as these characters of the stools show the disease to be extensive, and affecting chiefly the upper part of the large as well as in some cases part of the small intestine; (*c*) where the stools in conjunction with the symptoms that are laid down as characterising the true amœbic dysentery are present, the prognosis is

again unfavourable, on account of the high mortality that is said to attend this form of the disease; (*d*) the prognosis is of the worst possible character where the stools consist of blackish-red or blackish fluid with a horribly putrescent odour, and of bits of gangrenous tissue. Personally, I have never seen a patient passing this character of motion recover.

Lastly, where the stools, together with the course of the disease, indicate that chronic dysentery is present, by most authors the prognosis is regarded as unfavourable. Dr. Stephen Ward, formerly Senior Physician to the Dreadnought Hospital, Greenwich, however, states that in these cases, provided they are properly treated, recovery takes place in the majority of cases.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

◆

The Bacteriology of Milk. By GEORGE NEWMAN, M.D., and HAROLD SWITHINBANK. London: John Murray.

NOT since the classical work of the Franklands on "Micro-organisms in Water" has any special monograph upon bacteriology appeared, of equal importance to this. Just as the Franklands made their subject the vehicle of a widely generalised discussion on the leading features of their art, so have our authors made milk the substratum upon which they have founded a description of applied bacteriology, which from its clearness, accuracy, and practical value, leaves nothing to be desired.

Strictly, not to say pedantically speaking, the bacteriology of milk should include only a description of the species of bacteria belonging to and directly affecting milk, with perhaps some account of those forms which are known to act in the production of butter, cheese, koumiss, and so forth. The physiology of milk, with the factors which influence its variations, are treated of in a short opening chapter, and we note here that the authors agree with Barlow in emphasising the scorbutic tendency of boiled milk. The general dislike, especially amongst children, to being fed on boiled milk has always appeared to us as being based on something more profound than an aversion to the peculiar taste; and if it be true what these independent observers assert, then the dislike may be not gastronomic but instinctive. Chapter II. gives a good account of the authors' laboratory methods. In this their most valuable suggestions are those which deal with the difficult question of the standardisation of culture media, and the preparation of peptones. With regard to the former, they are not satisfied with the fractional method, which they give as "originally" recommended by the American Public Health Association's Bacteriological Committee, but which was in reality "originally" given out by Schultze in 1891. They prefer a process of neutralisation in bulk, which they describe in detail, and which would appear from the description to be quite practicable. Chapters follow on the isolation and culture of anaërobic organisms, and we then arrive at "The Bacterial Content of Milk." Here the researches of Park of New York are given in considerable detail, showing the influence of strict cleanliness during milking, in keeping down the number of organisms. The author's own researches in Finsbury and other industrial districts of London are chiefly of special interest as evidence of the general use of formalin as a milk preservative. Eight out of twelve samples analysed were found to be preserved by means of formalin. An interesting section follows upon the "Inter-relationship of Bacteria in Milk," concluding with an opinion by the writers, that "the standard of milk sterilisation should be almost entirely a standard based on the temperature which will ensure the destruction of spores." The chapter finishes with an account of the distribution of organisms in set milk and in separated milk respectively, the experiments showing that, in point of richness in organisms, the sediment contains most of them; then the set cream, separated milk, separated cream, whole milk, and lastly the set milk. If pathogenic organisms be present, these are to be found not only in the milk, but in all products—cream, butter, cheese, and whey—produced from the infected milk. The succeeding chapter, that on "Fermentation in Milk," gives a succinct account of this subject, now so important from the efforts being made at the production of pure cultures by which the ripening of butter and cheese may best be brought about. The chapters which follow on "Pathogenic Bacteria in Milk" are of great interest. The authors do not disguise that they have been by no means converted to Koch's heresy regarding the non-transmission of bovine tuberculosis to man. This brings them to a consideration of the acid-fast bacilli allied to the tubercle bacillus, which they place in four great groups—those affecting man, those occurring in the lower animals, those of butter and milk, and those of grass, respectively. Sticking well to their subject, the writers very properly neglect the two former groups, and pay particular attention to the two latter, selecting more especially the butter bacillus of Rabinowitch, and the timothy-grass bacillus. They conclude that the acid-fast bacilli differ from the true tubercle bacillus in respect of morphology, conditions of development, and in their feebler pathogenic properties. The latter half of the book is occupied with the discussion of two cognate topics, investigation of outbreaks of infectious disease, and the control of the milk supply. In considering the former topic, the authors have provided a résumé of all the facts relating to milk-borne epidemics up to last year, an epitome which should be of the greatest value to hygienists; as will also be the excellent chapters by Dr. Newman on the control of the milk supply, by the State, by private enterprise, and by the trade respectively. The style is clear and definite without being dogmatic, and the illustrations are very helpful. Some useful appendices are furnished, and the *ensemble* gives us a work which will at once commend itself as likely to be, for many years to come, the standard book on this important and recondite subject.

C. E. DOUGLAS.

A Text-Book of Obstetrics. By J. CLARENCE WEBSTER, M.D.(Edin.), F.R.C.P.Ed., Professor of Obstetrics, Rush Medical College, Chicago. Philadelphia and London: W. B. Saunders & Co.

THE perusal of this recent addition to obstetrical literature, coming as it does from so distinguished an authority, does not disappoint one's expectations. The first part of the book, devoted to the anatomy and physiology of pregnancy, includes a description of Peter's work on the early relations between the ovum and decidua, as well as an excellent account of the author's well-known investigations on this subject, carried out by frozen sections. The portion dealing with placentation is perhaps the best article on this subject that has as yet been published.

In the chapter on the management of labour, the author recommends that the external genitals of the patient should be shaved a few days before labour, to obviate risks that might otherwise occur. This is doubtless ideal advice, but we venture to think that sufficient cleanliness can be insured without recourse to this measure. When dealing with asepsis and antiseptics, the author strongly recommends crenasol, which is pure creolin without soda, the nearest approach to a perfect antiseptic on account of its penetrating qualities. He is a firm believer in the value of wearing rubber gloves. In his description of the kidney changes during pregnancy, he supports Halbertsma's view of ureteric compression, in so far that he believes there may be sufficient pressure on the ureters to cause at least a paresis interfering with their peristalsis.

In the chapters on eclampsia and the hæmorrhages, the author has nothing new to suggest in the way of treatment. Most authorities will agree with Professor Webster that all operations bringing about fixation of the uterus are unjustifiable in women who may become pregnant.

The chapter on ectopic pregnancy is well written, and in this section we note that the author believes many cases described as ovarian pregnancy are instances of growth of the ovum on portions of the Müllerian tract closely related to the ovary.

The author has entirely abandoned the use of antiseptic douches in puerperal infection, and instead he recommends that gauze, soaked in a glycerinated solution of formalin, should be applied to the interior of the uterus for twelve hours, and repeated if necessary.

Obstetric operations are fully gone into. We think it would have been better if the description of the application and use of the forceps had been given with reference to the patients being placed in the left lateral position, especially for the benefit of students in this country. In cases demanding rapid delivery, Professor Webster gives preference to vaginal Cæsarean section than to rapid dilatation, as carried out by modern dilators.

The book is written in clear and concise language, and the illustrations are in keeping with the general excellence of the work. We cordially recommend this scientific text-book, especially to those engaged in teaching obstetrics. It will doubtless enhance the reputation of the author, and it brings credit to the Edinburgh School of Obstetrics.

J. A. C. Kynoch.

Hypnotism: its History, Practice, and Theory. By J. Milne Bramwell, M.D. London: Grant Richards.

This book may be confidently commended to all those interested in hypnotism, as a careful and judicious presentation of the subject. It is the outcome of many years of patient scientific work, and the author's conclusions are always such as can be justified by his own experience or by that of other equally reliable persons. His aim is manifestly the establishment of the truth, and this will be highly appreciated by all conversant with the doings of impostors and charlatans who have used hypnotism only for self-advertisement or money-making. Dr. Bramwell acknowledges that there are many phenomena of hypnotism as yet unexplained, but he has done his best to record these phenomena in a scientific manner and to supply a basis for their explanation. There are probably very few who at this time will deny that there is such a thing as the hypnotic state, but it is a curious fact that in the minds of very many there is a lurking suspicion that it is uncanny, and that the less it is meddled with the better. Dr. Bramwell states that it has never been attended with evil results in his own practice, or where it has been employed by medical men as they would use other remedial agents. So far from weakening volition, he considers that it has the opposite effects, and that its curative influence is brought about by strengthening the patient's power of self-control. He gives many instances of its beneficial effects in medicine and surgery, and also relates some most interesting phenomena which have been manifested by hypnotised persons. The most striking of these is that relating to time appreciation, for which no satisfactory explanation has yet been offered. A very full and interesting account is given of various hypnotic theories, but none meets with his entire approval as explaining all the facts observed. It is to be hoped that the methods of strict scientific inquiry now being brought to bear on the subject will result in its ultimate elucidation.

JAS. MIDDLEMASS.

Sexual Life and Nervous Disease. By Dr. L. LÖWENFELD. Wiesbaden: J. F. Bergmann.

THIS is a third and enlarged edition of a work first published in 1891. The fact that two editions have already been exhausted shows that there is a demand for works of this class, but the question is prompted whether this demand has been mainly on the part of the medical profession, for whom the book is presumably intended, or on the part of the non-professional public. If the latter, it is very questionable if the book is doing any real service. The persons of this class who are most likely to read it are the very ones who will receive most harm from it, and it is quite conceivable that such reading may be the immediate cause of some of the disorders which the author describes. Apart from this general question, the subject has been treated fairly well. That sexual influences react on the nervous system will be readily conceded by most people who know anything of the matter, and it is certainly desirable to ascertain as accurately as possible what these reciprocal actions are. The book under notice can hardly, however, be said to add much of value to what is already known. The influence of adolescence, menstruation, the climacteric, self-abuse, and various other well-recognised sexual normalities and abnormalities on the nervous system, and in producing nervous disorder, are discussed in various chapters. Cases are also described to illustrate various points. This subject, however, in common with a good many other similar ones, is still encumbered by the defect of neglecting negative cases. Certain sexual factors in a case of nervous disease are inquired into and found to exist, and the inference is drawn that the former have a causal relation to the latter. This of course is not necessarily true, even if a hundred similar cases were discovered. It is still necessary to investigate all cases where the same sexual factors existed without the nervous disease. As well might general paralysis be attributed to toothache, because it was found, as might be the case, that 100 per cent. of general paralytics had suffered from toothache.

JAS. MIDDLEMASS.

An Atlas of Human Anatomy for Students and Physicians. By CARL TOLDT, assisted by ALOIS DALLA ROSA. Translated by M'EDEN PAUL, M.D. Part I. "Osteology"; Part II. "Arthrology." London: Rebman, Ltd.

THE now well-known and striking illustrations of Toldt's "Atlas of Human Anatomy" are by this translation rendered more accessible to English-speaking students, and cannot fail to be much appreciated, for, as the translator remarks in his preface, the atlas exhibits a high degree of originality in its methods of presenting anatomical facts. Without accepting the translator's views regarding the finality and the completeness of the science of human anatomy, and the possibility of "an accurate pictorial representation of *all* the data of human anatomy," one acknowledges most willingly that the atlas affords a magnificent series of pictures of the various parts of the human body.

The names most frequently employed in English text-books are introduced side by side with the Latin names employed in the original, different kinds of type being used to distinguish them. Cases in which the names used in the original are not those adopted by the International Committee are indicated by an asterisk. In some cases the translator has taken much care to remove pitfalls, due to the same name being used in England and in the atlas to indicate different structures. It seems, however, unnecessary to have retained in every case both names for the various structures, and by doing so the letterpress has assumed an irritating resemblance to a word-for-word translation, and the references of many of the figures have become very crowded. In many places a structure is actually named twice, in different kinds of type, in spite of the fact that the name employed in the original and the term used in the translation are identical. In some instances the usefulness of the work would undoubtedly have been increased had the text been adapted, rather than translated; this is especially so on p. 101, where a "purely literal translation" is given of the terms used in the original to indicate the principal measurements of the skull. The names given here in the translation, such as, "ear-height," "nose-height," and "profile-angle" afford no information in addition to what may be obtained by a glance at the figures in the original, even by a person without any knowledge of German. Also, in the figures illustrating the "regions of the human body," translations of the Latin names given in the original are supplied, although it is extremely doubtful if such English equivalents will ever become usual, even if the method indicated of subdividing the body should be adopted in this country.

The index provided at the end of each part enables the reader to find rapidly all the illustrations in which any particular structure is depicted, and greatly increases the value of the work. A few errors in the type, which have escaped notice, will doubtless be corrected in the next edition.

A. Francis Dixon.

I. *A Short Practice of Midwifery.* Fourth Edition.
II. *A Short Practice of Gynæcology.* Second Edition.
By Henry Jellett, B.A., M.D. London: J. & A. Churchill.

(I.) It is hardly necessary to emphasise the usefulness of a book which, within a period of six years, has reached a fourth edition. This book is written in a clear, simple style, and is essentially practical. The views expressed represent the teaching of the Rotunda School. The new edition extends to 530 pages. It has been thoroughly revised and brought up to date. The chapters on obstetric diagnosis and infant feeding are fuller than in earlier editions. In the section dealing with the forceps, preference is given to Neville's over other forms. An appendix is given referring to 1840 cases of labour, with a maternal mortality of 1 in 184·01. We have no hesitation in saying that this edition will enjoy the popularity of previous ones.

(II.) This second edition of Jellett's "Short Practice of Gynæcology," is likely to prove acceptable to the student, as it is a concise and practical guide on this subject. The first part of the book is devoted to a description of gynæcological diseases. In the chapters dealing with displacements of the uterus, Schultze's teaching is chiefly followed. In the treatment of pelvic hæmatocele the author recommends abdominal cœliotomy, reserving the vaginal route for suppurative cases. The second half of the book deals with gynæcological operations. It is well written, and the illustrations on vaginal cœliotomy, perineorrhaphy, and hysterectomy are specially clear and easily followed.

The present edition will doubtless prove as popular with students as the author's companion volume on midwifery.

J. A. C. Kynoch.

RECENT ADVANCES IN MEDICAL SCIENCE.

◆

MEDICINE.

UNDER THE CHARGE OF

A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,

MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

THE SCIENTIFIC BASIS OF CRYOSCOPY.

AT a time when cryoscopy is daily becoming a more recognised part of the clinician's armamentarium, a paper like this (Koranyi, *Moderne ärtz. Bibliothek*, Heft 1, 1904), by an admitted authority on the subject, dealing with the facts of physical chemistry on which the method depends, and explaining the principles on which inferences may be drawn from it, as well as suggesting the lines on which further research may be expected to yield information, both in pathology and clinical medicine, has particular interest to all who wish to employ cryoscopy intelligently. *Van't Hoff's theory of solutions*, an understanding of which is essential for an appreciation of the new method, is shortly as follows:—Any substance in solution behaves like a gas in a closed vessel, *i.e.*, it constantly endeavours to occupy as large a space as possible, and in doing so exerts osmotic pressure which can be measured directly by a manometer, and is found to depend on the *nature of the dissolved substance*, the *concentration*, and the *temperature*. It can also be estimated indirectly by noting the action of various solutions in different concentrations on cells, *e.g.*, red blood corpuscles, the concentrations which just produce minimal plasmolysis being reckoned *isotonic* with the cell contents, and therefore isotonic with each other. Equal volumes of such isotonic solutions contain equal numbers of dissolved molecules, are *equimolecular*, and their osmotic pressures are equally influenced by any variation in temperature. From this it is evident that a general law of osmotic pressure must exist, and it has been shown that 1 grm.-molecule of any substance dissolved in 22·13 litres of water has an osmotic pressure of 1 atmosphere at 0° C. Van't Hoff's laws of solutions are analogous to those governing the diffusion of gases—(1) At a given temperature the osmotic pressure is proportionate to the concentration of the solution. (2) At a given concentration the osmotic pressure of any solution is proportionate to the absolute temperature. (3) At a given osmotic pressure and temperature, equal volumes of solutions are equimolecular. (4) The osmotic pressure of a solution of several substances is the sum of the osmotic pressures of each. (5) Dissolved substances exert the same osmotic pressure which they would do as gases at the same temperature and volume. *Measurement of osmotic pressure by cryoscopy.*—The freezing point of a fluid is lowered when anything is dissolved in it, the lowering being proportionate to the number of molecules per unit of volume; equimolecular solutions, accordingly, have the same freezing points. Thus, lowering of the freezing point is a measure of the osmotic pressure. A solution of the strength of 1 grm.-molecule in 100 grms. H_2O has its freezing point lowered by 18·5° C., and since a solution of 1 grm.-molecule in 22·35 litres has an osmotic pressure of 1 atmosphere, the stronger solution has an osmotic pressure of 223·5 atmospheres; therefore, lowering of the freezing point by $1° = \frac{223·5}{18·5}$ or 12·05 atmospheres of osmotic pressure. (Bases, acids, and salts, on account of their electrolytic properties, form an apparent exception to some of these laws.) The apparatus recommended by Koranyi is Beckmann's cryoscope, by which the freezing point can be estimated with an error of under 0·01°. Full details both of the method and the best way of avoiding sources of error are given, but for these the original must be referred to. *Physiological and pathological basis of the clinical applications of cryoscopy.*—Throughout the organism more or less different osmotic pressures exist, according to the metabolic processes taking place. However variable they are, all, in the higher animals, strive to attain a constant, and for each animal characteristic, level. In the marine invertebratæ the freezing point of the tissue juices is that of the surrounding water, and not till the teleosteans are reached is a specific freezing point found. As we ascend the scale the freezing point of the blood becomes more and more fixed, until in man it is $-55°$ to $-57°$, an osmotic pressure of 7·55 to 7·97 atmospheres, the mean being 7·7. This constant osmotic pressure in man is clearly associated with his constant temperature. (In what follows, δ = extent to which the freezing point of the *blood* is lowered = osmotic pressure; Δ = that of *urine.*) The first question is, How is this constant pressure maintained? What are the osmo-regulating organs?—(1) *Skin.*—The activity of the skin being almost wholly due to external conditions, and its secretions being hypotonic, its only action is to raise osmotic pressure in the body, not to regulate it. (2) *Digestive tract.*—The number of molecules and amount of water ingested are highly variable, and therefore the osmotic pressure of the food is most inconstant. In the stomach it becomes, if not so already, hypotonic, and in the intestine isotonic in relation to the tissue juices. The walls of the digestive canal, therefore, only regulate the osmotic pressure of their own contents, and that at the expense of the blood. Notwithstanding this, δ does not vary with digestion and absorption, and is quite independent of the nature and quantity of food. (3) *Lungs.*—If the blood contain CO_2 in excess, as in asphyxia, δ is increased, but immediately returns to normal when the blood is reoxygenated. This was one of the first discoveries in clinical cryoscopy. (4) *Kidneys.*—The metabolism of nitrogenous compounds is a constant source of increased osmotic pressure, on account of the great increase in the number of dissolved molecules which it causes—*e.g.*, 1 molecule of albumin decomposing into 86 of urea. To the kidneys, therefore, we look for osmo-regulation, by the removal of superfluous molecules and water. Other glands, of course, excrete molecules and water, but their excretions are hypo- or iso-tonic, and can never lower the osmotic pressure; the excretions are also of too stable composition to adapt themselves to the changing requirements of osmotic equilibrium. The net result is that, although the influx of molecules and output of water vary, the osmotic pressure throughout the body tends to rise, and in order to maintain osmotic equilibrium some means of eliminating quantities of molecules in any bulk of water that occasion may demand must be provided. This work is done by the kidneys. *Removal of the kidneys.*—After complete nephrectomy, the osmotic pressure rises from accumulation of organic molecules (not NaCl). The rise in δ is lessened by a carbohydrate diet for some days before operation, as well as by curarising, which checks muscular metabolism. *Diminished activity of kidneys.*—(*a*) In some cases of renal disease without dropsy, metabolic equilibrium remains although δ is increased. This means that the "threshold of secretion" of the kidneys is high, and that the molecules in the blood must be abnormally concentrated, before they can be completely excreted by the kidneys. (*b*) If, however, the kidneys are more seriously damaged, and their secreting area diminished by *at least a half*, they are no longer able to excrete the requisite number of dissolved molecules, δ increases, and the osmo-regulating mechanism breaks down. For osmo-regulation, moreover, the maintenance of water equilibrium is as important as the molecular excretion. Relatively more molecules than water have usually to be excreted, hence the osmotic pressure of the urine, as shown by its freezing point (Δ), is normally greater than δ. But the amount of superfluous water and the number of urinary molecules in the blood are not fixed quantities, so that the osmotic pressure of the urine varies throughout the day. In a twenty-four hours mixed sample of normal urine Δ may be from 1·2° to 2·3° under ordinary circumstances; if much water be drunk, it may fall to 0·10°; if very little, rise to 3·5°. This last figure represents a difference between Δ and δ of 40 atmospheres. If the osmotic activity of the kidneys fail, excretion of concentrated solutions of urinary molecules becomes impossible, and accordingly in renal disease Δ varies between 0·60° and 1·2°—*i.e.*, its limits are less than in health. But low Δ is not *per se* absolutely indicative of disease. In certain cases of acute nephritis Δ may be large, probably because the part of the kidney which excretes molecules is spared; and, on the other hand, in diabetes insipidus Δ is very small—0·05°, δ being normal or slightly raised. In infants Δ is usually less than δ. In health, too, drinking copiously may render the urine hypotonic. Approximation between the values of Δ and δ is only of pathological moment when it occurs under conditions in which healthy kidneys ought to exert great osmotic pressure. Inferences drawn from Δ alone, even in patients on standard test diets, are fallacious, but attention to the effects of copious ingestion of water gives valuable information. Weakened kidneys can excrete neither a highly concentrated nor very dilute urine. For example, after drinking 1·8 litres of mineral water, Δ sinks in health to under 0·10°, while in parenchymatous nephritis it is scarcely altered. In a case of unilateral pyonephrosis, Δ on the diseased side was 0·49°, on the healthy side 1·63°; after copious drinking, the figures were ·34° and 0·08° respectively. It cannot therefore be said that in nephritis, Δ is invariably lower than in health; it only is so if the patient restricts his intake of fluid. In parenchymatous nephritis, both the concentrating and diluting power of the kidneys are lessened; in interstitial nephritis the former is diminished, the latter normal; in chronic venous congestion the former is normal, the latter diminished; and in diabetes insipidus the former is abolished, the latter normal. *Effect on osmo-regulation of interference with either or both functions of kidney.*—(1) In circumscribed affections and in contracted kidney molecular excretion is impaired, but the maintenance of watery equilibrium is intact. Retention of molecules can be detected by examining Δ, only if the retention is extreme; but even where it is slight, it can be detected by δ which rises above 0·58°, even as high as 1·02°. With high osmotic blood pressure there is thirst, and increased intake of water. If the kidneys were true osmo-regulators, they could compensate for high δ by excreting large quantities of fairly concentrated urine. This, however, does not happen; what does take place is, that they maintain watery equilibrium at the expense of osmotic equilibrium—polydipsia being followed by polyuria, and δ going on rising. This failure to adapt the excretion of water to the demands of osmotic pressure means the disappearance of osmo-regulation. (2) In parenchymatous nephritis, where the power of maintaining water equilibrium as well as that of molecular excretion is lost, we have as before increased thirst and polydipsia. There is also diminished evaporation, as can be shown by the slowness with which the weight falls after drinking water as compared with health. In this form of nephritis the increased intake of water and the diminished evaporation are the actual osmo-regulative factors. Δ is unaffected by the amount of fluid drunk, and δ is little altered; in the struggle between these actual osmo-regulators and the regulators of watery equilibrium (the kidneys) the former carry the day, and, Δ and δ being unaltered, dropsy ensues. On this theory of dropsy, the first essential is that there be retention of molecules, the second that there be retention of water. Cases of complete mechanical obstruction of the ureters for some reason do not show the former, δ being normal. In no disease of the kidneys is the power of maintaining water equilibrium alone abolished, but such a state of matters is artificially produced by the operation of transplanting the ureters into the intestine (for ectopia of the bladder). In these cases the urine escaping from the anus is isotonic, *i.e.*, the action of the kidney in regulating watery equilibrium has been annulled by the action of the wall of the bowel, which, as we have already said, renders its contents isotonic at the expense of the blood. No dropsy, however, occurs—a fact which confirms the view expressed, that the first essential in the production of dropsy is the retention of dissolved molecules.

The whole article will well repay study by those who are desirous of using cryoscopy.

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

LECTURER ON SURGERY, SCHOOL OF MEDICINE, EDINBURGH.

INTERNAL URETHROTOMY.

Bagozzi (*Ann. d. mal. d. org. genito-urin.*, Paris, February, 1904) contributes an important work on the subject of internal urethrotomy for stricture of the urethra. He quotes seventeen cases in which the operation was followed by most satisfactory results, in rapidly re-establishing the calibre of the urethra. The results were such, that in certain cases it was not necessary to continue dilatation after the patients left hospital, but in others periodic dilatation was carried out at intervals varying with the nature of the stricture. In all the cases an instrument was left in the urethra for twenty-four hours after the operation, and for a variable time progressive dilatation was carried out while the patients were under treatment. The author lost one patient some time after the operation, from pneumonia.

Internal urethrotomy, according to Bagozzi, is indicated—(1) when the stricture cannot be dilated; (2) when it is necessary rapidly to restore the calibre of the urethra; (3) when the stricture, although dilatable, rapidly contracts again; and (4) when, although the stricture is dilatable, certain secondary lesions are not cured by the removal of the constriction. In practice, the operation is usually done to meet several of these indications. When the constriction is such that slow, progressive dilatation is not applicable, the urethrotomy is done to get rid of the stenosis, and to prepare the urethra for dilatation. The dilatation may then be looked upon as the complement of the urethrotomy. When the stricture is easily dilated, but the dilatation does not cure the condition or its complications, the urethrotomy may be looked upon as the complement of dilatation. As regards the contra-indications, Bagozzi admits that a urethrotomy made near a focus of infection may give rise to grave general symptoms; he does not agree with Albarran that the operation is forbidden in the presence of a urinary abscess or a fistula. He employs a simplified form of Maissoneuve's instrument.

THE SURGICAL TREATMENT OF NON-TRAUMATIC JACKSONIAN EPILEPSY.

Krause (*Centralbl. f. Chir.*, Leipzig, 1903, No. 36) holds that surgical interference in non-traumatic epilepsy should be strictly limited to those cases in which the nature and sequence of the spasms indicates a definite area of the sensori-motor region as the primary seat of irritation. He records four such cases in which he operated. The first was that of a girl, æt. 16, who had suffered from Jacksonian epilepsy for twelve years, the spasms beginning in the left side of the face. Operation disclosed a large cyst under the face-centre, which was incised and drained. Cure of the epilepsy resulted along with marked improvement in the patient's mental condition. Nine and a half years after the operation, the patient was still well and had had no recurrence of epileptic attacks. The second case was that of a girl, æt. 14, in whom operation disclosed a thick, white scar over the face-centre. The scar was removed, and cure of the epilepsy resulted. No recurrence had taken place a year and a half after the operation, when the case was reported. The third case was that of a man 30 years of age, in whom the attacks began in the left forearm. Operation showed only a chronic leptomeningitis over the arm-centre. The centre was excised, and recovery followed. In the fourth case, that of a man æt. 23, the spasms began in the right hand and forearm, and operation disclosed a subarachnoid cyst, which was removed. Recovery followed.

In discussing the operation, Krause recommends that a large flap of bone be turned down in the region of the affected area in the cortex, and that the dura should be opened in every case whether it appears normal or not. In all the four cases reported, the appearance of the dura was healthy. Careful inspection of the cortex itself is necessary in order to recognise foci of disease, and Krause therefore maintains that the view of those who hold that when the dura appears healthy and pulsates normally, the operator should not open it, is untenable.

When obvious lesions are present, as in three of the reported cases, no difficulty arises in carrying out treatment. In many cases, however, an obvious cause for the epilepsy cannot be found, and in these Krause recommends that a systematic examination of the cortex should be undertaken by electrical stimulation, to determine exactly the spot where the spasms begin. When that is determined, exploratory puncture or incision is made to ascertain the presence or absence of a subcortical lesion. In the absence of such a lesion, the question arises as to whether the centre concerned should be excised or not. In discussing this question, Krause lays stress on the fact that the position of cortical centres cannot be accurately determined by any method of cranio-cerebral topography, and that, even when the brain is exposed, the anatomical details of the exposed area do not act as reliable guides owing to the variability of the fissures and convolutions. He insists that electrical examination of the cortex is absolutely necessary to determine accurately the portion of cortex to be excised, and that the results of earlier operations, in which this was not carried out, are open to criticism. When the affected area is determined, the grey matter and soft membranes are excised. The danger of the operation is not increased by this, and the paralysis which follows generally disappears.

As regards the prognosis, Krause regards it as far from good in cases where no gross lesion is found. This fact, however, should not deter from operating in suitable cases, for the operation is not a dangerous one, does not cause any increase in the spasms when it fails to cure, and in certain cases is followed by great improvement in the patient's condition.

THE TREATMENT OF FACIAL PARALYSIS BY NERVE TRANSPLANTATION.

HACKENBRUCH (*Centralbl. f. Chir.*, Leipzig, 1903, No. 36) records a case of nerve transplantation for facial paralysis of more than seven years standing, in a girl 8 years of age. The spinal accessory nerve was made use of, and two-thirds of it implanted in a longitudinal slit in the trunk of the facial nerve. Hackenbruch hoped that by this method of transplantation a free growth of primitive fibres of the spinal accessory would take place into the facial. Nine months after the operation, great improvement in the paralysis had taken place, and the child could voluntarily move the muscles acting on the angle of the mouth. The muscles supplied by the spinal accessory nerve suffered little, electrical stimulation showing that only the lower third of the trapezius did not respond to the interrupted current. Encouraged by the successful result in this case, Hackenbruch transplanted a portion of the internal into the external popliteal nerve, in a case of infantile paralysis affecting the muscles supplied by the external popliteal. Three months later, considerable improvement had taken place, but sufficient time had not elapsed to allow of the final result being noted.

INFLAMMATION IN AN APPENDIX IN THE SAC OF AN INGUINAL HERNIA.

BAILLET (*Rev. de Chir.*, Paris, February, 1904) reports the case of an infant who suffered from a reducible inguinal hernia from birth. When 13 months old the hernia suddenly became irreducible, and presented symptoms suggestive of strangulation. Twenty-one hours after the onset of symptoms, the hernia was exposed by operation, in the belief that it was strangulated. The sac was found to contain the termination of the ileum and a part of the cæcum. Between these two portions of bowel was found an enlarged and inflamed lymphatic gland, and behind the cæcum the appendix was found turgid and inflamed. The appendix was removed, the radical cure performed, and the patient recovered.

TORSION OF THE SPERMATIC CORD.

SOULIGOUX (*Rev. de Chir.*, Paris, February, 1904) recently met with a case of torsion of the cord in a man, æt. 29, whose testes were normally developed, and had descended to the bottom of the scrotum. He was suddenly seized with acute pain and swelling of the testis, the clinical features being those of an acute orchitis. As there was no history or other evidence of urethral trouble, the condition was supposed to be an acute tuberculosis, and as the patient was suffering greatly it was decided to operate. The testis was exposed by a scrotum incision, and the tunica vaginalis was found to contain about 30 grms. of blood and clots, and the testis and epididymis were suspended by the cord, which was greatly thickened, and which on examination was found to be twisted through 180°. The torsion had taken place from within outwards. On account of the amount of damage sustained by the testes, Souligoux performed castration.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
F. W. N. HAULTAIN, M.D., F.R.C.P.Ed.,
PHYSICIAN FOR DISEASES OF WOMEN, DEACONESS HOSPITAL, EDINBURGH;
AND
J. A. C. KYNOCH, M.B., F.R.C.P.Ed.,
PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, ST. ANDREWS UNIVERSITY.

Full-time Extra-uterine Pregnancy with Living Child.

Czyzwicz (*Centralbl. f. Gynäk.*, Leipzig, 1904, No. 4) reports the following cases:—P. had three normal confinements; complained of backache throughout the fourth pregnancy. The pelvis was generally contracted to a slight degree. The abdominal swelling was chiefly marked on the right side; fœtal parts were very distinct, and heart sounds audible. Through the posterior fornix a swelling was detected, through which the sutures and posterior fontanelle could be felt. In the middle line, and extending half way to the umbilicus, there was a swelling, which proved to be the empty uterus, the diagnosis of an 8-months ectopic gestation with living child being made. The pregnancy was allowed to go on to full time.

With the onset of pains, exactly like ordinary uterine contractions, the abdomen was opened by an oblique incision. The sac was found intimately adherent to intestine, omentum, uterus, and peritoneum, rendering its complete removal impossible. On account of hæmorrhage, from partial detachment of the placenta, the latter was removed, and both broad ligaments seemed to control parenchymatous bleeding. The child, slightly asphyxiated, recovered. The mother died on the fourth day. The post-mortem examination showed that the gestation sac probably had its origin from the right ovary.

Technique of Vaginal Cæsarean Section.

Rühl (*Centralbl. f. Gynäk.*, Leipzig, 1904, No. 2) has performed this operation nineteen times during the past seven years. He points out the importance of dilating the cervix before incising the uterus, although the operation is thereby slightly retarded. By so doing, however, a shorter uterine incision is sufficient. The bladder does not require to be reflected so far, and there is much less chance of the lochial discharge being retained. He describes a case illustrating the last condition. Rühl further points out the necessity for avoiding hæmorrhage, which is apt to occur when reflecting the bladder, on account of the great venous development during pregnancy. The uterine incision must be in the middle line, and need not extend upwards beyond 7–9 cms., to permit of the delivery of a full-time child. Where the cervix is unusually rigid, it may be necessary to incise the posterior uterine wall. He describes the technqiue necessary in cases of difficult labour, following on vaginal fixation of the uterus. He recommends a vagino-uterine incision in such case.

A CASE OF HEBOTOMY.

ARNDT (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 49) refers to two cases published by Baumm, who regards the operation as in no way superior to symphyseotomy. Arndt reports the following case:—P., æt. 36, 2-para.; pelvis flat; measurements—intercristal, 29 cms.; intersp., 26½ cms.; external conjugate, 19 cms.; intertroch, 31 cms.; conjugate vera, 8½ cms. Forceps in Walcher's position failed. On account of high temperature and fœtid discharge, hebotomy was preferred to Cæsarean section. An oblique incision was made, extending from the left pubic spine to the junction of middle and lower third of left labium major. The bone was exposed, and, guided by two fingers in the vagina, divided by Gigli's chain saw. The pubic bones separated to about three fingersbreadth. Delivery completed by forceps. The periosteum was united by catgut, and the woman delivered in the usual way. There was very little hæmorrhage during the operation, and the patient was convalescent and left hospital on the twenty-fifth day.

TWO CASES OF OVARIAN PREGNANCY.

MICHOLITSCH (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 51) reports two cases where the ovarian capsule had ruptured and formed a mole and hæmatocele. There was a distinct amniotic cavity, but no embryo could be discovered. In each case the mole was surrounded by ovarian tissue, and Graffian follicles were found in the capsule. The tubes in both cases were intact, and the fimbriæ free. There was in each case a history of two months amenorrhœa, followed by more or less continuous hæmorrhage. Pain is not such an outstanding symptom, according to Micholitsch, in those cases, as in ordinary tubal pregnancy. Both cases were successfully treated by colpotomy.

LABOUR OBSTRUCTED BY A PRE-SACRAL TUMOUR.

KEITLER (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 46) reports the following case:—P., æt. 27, 4-para. The third pregnancy was terminated by version, delivery of the after-coming head being greatly delayed on account of pelvic obstruction, by a tumour extending from the sacrum into the pelvis. The fourth pregnancy was terminated by Cæsarean section. The child lived, but the mother died on the following day. The pelvic tumour measured 14 cms., was spherical in shape, with an irregular surface. The tumour was probably a sarcoma undergoing myxomatous degeneration. There were numerous secondary growths in the liver, the largest measuring 2·6 cms. in diameter.

THERAPEUTICS.

UNDER THE CHARGE OF
RALPH STOCKMAN, M.D., F.R.C.P.Ed.,
PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY;
AND
FRANCIS J. CHARTERIS, M.B.,
ASSISTANT TO THE PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY.

SECRETINE.

SECRETINE is the name given to an extract obtained by macerating the duodenal mucous membrane in an acid medium. Injected into the blood, secretine acts as a powerful stimulant to the liver, pancreas, and intestinal juices. It has also apparently an action on the motor apparatus of the intestines. Normally, the arrival of acid substances in the duodenum liberates this secreto-motor stimulation. Enriquez, in a recent communication to the Académie de Médecine, points out that certain cases of dyspepsia are really examples of disturbed intestinal function, rather than of the stomach. These cases can be benefited by the exhibition of acids. The acids should not be administered immediately after the meal, but after a lapse of three or four hours, when the acidity of the stomach contents normally reaches its maximum. To ensure a more direct action on the duodenum, he has administered tartaric acid in gluten capsule. Gluten is unaffected by the gastric juice, but readily dissolves in the alkaline intestinal contents. He has tried these capsules in sixteen cases, all of which suffered from chronic constipation. The cases can be arranged in three groups. In seven cases, constipation was the chief complaint; abdominal pain, fermentation, etc., being less troublesome. In all these cases the acid regulated the bowels. The case of a man suffering from disseminated sclerosis was particularly instructive. For years he had had only a motion every six or seven days. Ordinary purgatives had no action, though enemata gave some relief. As long as this patient took the capsules, he had regular action of the bowels, but constipation came on again as soon as they were stopped. In the second group of five cases, the constipation was associated with mucocolitis, with attacks of abdominal pain and the passage of glairy mucus and casts. In four instances these symptoms of colitis improved as well as the constipation. The last batch of cases represented intestinal dyspepsia. The patients suffered from slow digestion, fulness and weight after meals, somnolence and inability to work, and constipation. In all such cases the acid capsules caused rapid improvement.—*Presse méd.*, Paris, February 17, 1904.

DIGESTIBILITY OF VEGETABLES.

BRYANT and Milner have investigated the digestibility of some of the commoner types of vegetables. On three healthy subjects, the digestive value of potatoes, cabbage, beets, apple sauce, and green corn was determined. The plan pursued was the following. A diet of meat, bread, butter, milk, and sugar was chosen, and it was found out, by actual experiment for each subject, what quantities of these substances were most agreeable to him. The ratio was then fixed of the various ingredients, and for three days each subject lived on his chosen diet. By analysis of the urine and fæces, the digestibility of such basal ration was fixed. To it was then added as much of the chosen vegetables as the subject could take. As far as possible no alteration was made in the basal ration, and if any such alteration was required, all the constituents of the diet were reduced proportionately. In actual practice, it was found necessary to make only very slight alteration in the basal quantities. It was assumed that the basal diet was digested to the same degree with and without the vegetable, and any alteration in excreted material was put down to the vegetable factor, and in this way an indication of the digestibility of the vegetable was obtained. The authors found that only a very small portion of the protein in cabbage was digested. On an average 82 per cent. of the available carbohydrates was digested and utilised, and probably about 57 per cent. of the total energy available in the cabbage was utilised. For potatoes about 73 per cent. of protein and 99 per cent. of the carbohydrates appeared to be digested, representing 94 per cent. of the total available energy. The digestibility of the beets was also high; for protein 72 per cent., for carbohydrates 97 per cent., and 90 per cent. of the total available energy was contained in the digested material. The protein of apple sauce was poorly digested, but the carbohydrate value represented 99 per cent., and apparently the digestible portions constituted 99 per cent. of the total energy of the sauce. The authors conclude that the vegetables included in this series of experiments, so far as fat and proteids are concerned, are of little value. The carbohydrates they contain are quite well digested and absorbed, and to this extent they act as sources of energy. The chief value of many vegetables is due, apart from this, to the variety and palatability they give to the diet and to the bulkiness given to the food. They also furnish organic acids and mineral salts, and may also favourably affect the digestion of the other food stuffs.—*Am. Journ. Physiol.*, Boston, October 1, 1903.

OILY SOLUTIONS OF IODINE IN GOITRE.

DUBAR in this paper reports two cases in which he has used an iodised oil (40 per cent.) as an intraglandular injection in simple goitre. The amount injected at one time was 1 c.c., and this was repeated once a week. The oil was injected very slowly, and caused no pain or reaction. On two occasions the injection gave rise to small nodules about the size of a nut, but these gradually were absorbed. In the one case nine injections were given, at the end of which the goitre has become much less prominent, and of distinctly softer consistence, so that it was difficult to determine the outlines of the gland. The improvement was permanent. The second case was similar. In this instance six weekly injections were made, and after an interval of six weeks a further course of four injections was given. The author is very satisfied with this form of treatment. It is much less painful than the ordinary injections of the tincture of iodine. The amount of iodine contained in 1 c.c. of 40 per cent. iodised oil is nine times more than that contained in the same quantity of the tincture. The oil causes no reaction, while the tincture is always more or less painful. This is perhaps due to the fact that the oil forms a definite combination with the iodine.—*Progrès méd.*, Paris, January 23, 1904.

THE BEST METHOD OF USING DIPHTHERIA ANTITOXIN.

CRUVEILHIER has performed a series of experiments in guinea-pigs, to determine the relative efficiency of different methods of administering antitoxin. He inoculated his animals with living cultures, and found that they died in thirty-six to forty-eight hours. A single injection of $\frac{1}{10}$ c.c. antitoxin was efficacious up to ten hours after the injection. A massive dose extended this period to twelve hours in some cases, while repeated doses were always successful up to twelve hours. Direct intracerebral injection cured, if within twelve hours and occasionally up to fourteen hours. Intravenous injection of the antitoxin was most efficacious, as it was successful even up to sixteen hours after the inoculation. With injection of the toxin, similar results were obtained. A single subcutaneous injection of $\frac{1}{10}$ c.c. antitoxin saved life up to the eighth hour. A massive dose extended this period as a rule to twelve hours, while repeated administration gave more certainty. The intracerebral injection proved inferior to the other methods, but the direct intravenous injection still acts successfully two hours after all other methods are useless. The general conclusion come to is that, in diphtheria as in tetanus, there is a time when antitoxin in any form is useless. It is proper and right to give an initial large dose, and to repeat this if the case is grave. The most certain method of administering the antitoxin is by direct intravenous injection. It seems to produce the maximum of therapeutic affect.—*Ann. de l'Inst. Pasteur*, Paris, January 25, 1904.

POISONING WITH OIL OF GAULTHERIA.

PRICE and L'Engle have observed such a case in a child æt. 2, who swallowed about a drachm of commercial oil of wintergreen. The child vomited several times, till lavage was done. There was no pain for the first two hours, but then the child seemed to have pain in the abdomen, and became drowsy and complained of thirst. The pulse rose to 130, the child became flushed, with irregular and laboured respirations and hallucinations of vision. The temperature was not increased, but there was muscular twitching, delirium, and diarrhœa. Five hours after taking the drug, the temperature was 99°·4 ; pulse 132, of good volume; respiration regular, but somewhat laboured. At the end of seven hours, there was a general convulsion, and the pulse became slightly irregular. The respirations were deep and laboured, and gradually diminished to four or five a minute, and at the end of nine hours the child died of respiratory failure.—*Am. Journ. Med. Sc.*, Phila., 1904, No. 2.

Unusual Case of Potassium Iodide Idiosyncrasy.

Gathmann reports the case of a man, æt. 52, who was ordered to use a saturated solution of potassium iodide. Beginning with three daily doses of 10 minims, this amount was increased by 1 minim daily, so that on the fourth day he took three doses of thirteen drops each. His finger-tips on this day showed slight cyanosis, and the drug was entirely stopped for twenty-four hours, and the cyanosis completely disappeared. On the evening of the sixth day, a single dose of 14 minims was given, and produced a diffuse ecchymosis on the fingers and thumbs, so that it appeared exactly as if he had dipped his finger up to the knuckles into a solution of indigo. The fingers were cold, numb, stiff, slightly swollen, and very painful. The little fingers were most involved, the thumbs least. The tip of the nose was also affected; the toes remained unaffected. There were a few isolated purpuric spots on the thighs and on one arm. Under warmth and friction, the swelling and pain disappeared very gradually, leaving blisters on the fingers. There was no other symptom of iodism.—*Med. Rec.*, N. Y., January 30, 1904.

INSANITY.

UNDER THE CHARGE OF

Sir JOHN BATTY TUKE, M.D., Hon. D.Sc.Dub., F.R.C.P.Ed.,

SUPERINTENDENT OF SAUGHTON HALL ASYLUM;

AND

JOHN MACPHERSON, M.D., F.R.C.P.Ed.,

COMMISSIONER IN LUNACY FOR SCOTLAND.

Uncertified Insanity and certain Forms of Moral Defect.

In an inaugural address read before the Midland Medical Society, Dr. G. H. Savage (*Birmingham Med. Rev.*, December, 1903) draws attention to the fact that there are several groups of persons who cannot be certified in the ordinary way, but who ought, for their own good and for the sake of society, to be controlled to some degree. There are, he urged, those who are technically sane, yet who require supervision, and those who have been insane and are liable to recurrent outbreaks. There are also persons who require protection for their property, and those who require control for the good of others as well as for their own sakes. Among numerous examples of the class of person who require control, the following may be selected—(1) Those who are feeble-minded from birth, but who seem able to converse rationally and to mingle with their fellows, but who are totally unable to judge as to the real value of money or its responsibilities. This group contains many coming from a neurotic stock. (2) Those who break down mentally at the adolescent period, and acquire vicious and criminal habits, become indifferent as to their responsibilities and impatient of control. In this division are to be placed the so-called "hysterical" girl, for whom some sort of protection outside an asylum is much needed. (3) There is another class, who, without being apparently feeble-minded, are distinctly antisocial in their proclivities and instincts. (4) Senile spendthrifts may exhibit only a slight degree of mental weakness, and yet be totally unfit to manage their own affairs. There is a common change in affection towards relations, and an unreasonable tendency to be charitable to others, as illustrated by the making of wills in favour of strangers and philanthropic objects. (5) There is the more infrequent case of the miser, a section of which class not only become alien in conduct, but often make foolish wills. (6) Sexual misdemeanants are more to be pitied than blamed. Many of those cases are treated as criminals; others are treated as criminal lunatics; while many rove about the world, a constant cause of trouble to their relatives. (7) There is a certain number of persons who suffer from true recurring insanity. These patients are so well as to be able to resume their duties and their positions, but although they, from time to time, go wrong, they are not certifiable. In the same category Dr. Savage places the dispsomaniac and the epileptic. While admitting that there is every reason to be careful in not unduly interfering with the liberty of the subject, the author concludes that there are certain grave defects in our laws which prevent us from dealing adequately with the various classes of mental and moral failure above referred to.

A Contribution to the Study of Katatonia.

In a long article, Mouratoff of Moscow (*Arch. de Neurol.*, Paris, January, 1904) concludes that katatonia is a morbid entity. He argues, contrary to the opinions of Westphal, Mendel, and Kraft-Ebing, that here we have to do with a true disease presenting a typical clinical course, an anatomico-pathological basis, and a distinct etiology. (1) The course of the disease presents two types—a progressive and a remittent one. Commencing with acute delirium, characterised by hallucinations and incoherence, the patient may apparently recover only to succumb later on to an attack of mental confusion with the physical symptoms of katatonia, such as catalepsy, impulsive conduct, and verbigeration. This is the intermittent variety. In the progressive form the true katatonic symptoms follow the primary delirium, and end in terminal dementia. (2) The pathological basis of the disease is an atrophy of various parts of the cerebral cortex, with particular incidence upon the motor and association areas. (3) The etiology of the affection is complex, being an auto-intoxication affecting individuals highly predisposed to mental and nervous disease.

Experimental Observations on Katatonia.

With the object of obtaining a minuter knowledge of the physical symptoms of katatonia, Drs. Bruce and Peebles publish (*Journ. Ment. Sc.*, London, October, 1903) the results of their observations upon the physical symptoms and pathogeny of this disease. For convenience of description, they divide the disease into two stages: (1) The stage of acute onset; (2) the stage of stupor. In the first stage the alimentary system is disordered; there is no desire for food, and vomiting is common. The heart's action is irregular and intermittent. The arterial pressure gradually rises during this stage. The pupils are dilated and sluggish; dulling of sensibility is common; and in every case the control of the organic reflexes of defæcation and micturition is imperfect. Sleep is deficient. The temperature is irregular, sometimes slightly febrile in the evening, sometimes paradoxical. During this stage there is a moderate persistent leucocytosis. Bacterial examination of the blood was made in eight cases by running 3 to 4 c.c. of blood into 200 c.c. of sterile broth, by means of an exploring needle passed into any prominent vein in the forearm. Five of the flasks were sterile; three contained organisms; two of these were apparently accidental contaminations, but the third presented a pure culture of a short streptococcus. On testing the agglutinative power of the blood of the latter patient upon this organism, in a broth dilution of 1 in 30, agglutination was complete in two hours. In the second stage the temperature is uniformly subnormal, the blood tension low, the extremities blue, cold, and œdematous, and the lungs liable to tuberculous infection. At the commencement of this stage the leucocytes usually fell below 8000 per c.mm., but soon they rose again, running on an average between 12,000 and 16,000 per c.mm. As recovery progressed, the leucocytes did not necessarily rise, but the percentage of polymorpho-nuclear cells increased. In the cases which did not recover, the percentage of the polymorphonuclear cells fell below 50 and in one case below 30. A number of experiments on rabbits, by feeding them on this streptococcus and by injecting them with it, are given in the paper. The authors conclude as follows—(1) Katatonia is an acute toxic disease with a definite onset and course, in which the symptoms vary according to the resistive power of the patient. The disease is clinically characterised by a prodromal period of gradual onset, which merges into the period of acute onset or first stage; and by a second stage, characterised by a condition of stupor with muscular resistiveness to passive movement. (2) In 70 per cent. of the cases there is an agglutinin present in the blood, which appears to be a specific agglutinin to a short streptococcus which was isolated from the blood in one case. (3) Active immunisation in the acute onset of the disease, tried in one case only, produced undoubted benefit.

DERMATOLOGY.

UNDER THE CHARGE OF

W. ALLAN JAMIESON, M.D., F.R.C.P.Ed.,

LECTURER ON DISEASES OF THE SKIN, UNIVERSITY OF EDINBURGH.

HYPERTROPHIC ACNE OF THE NOSE AND ITS SURGICAL TREATMENT.

THOUGH, as Dubreuilh remarks (*Ann. de dermat. et syph.*, Paris, November, 1903), hypertrophic acne of the nose is not a frequent disease, yet it is a conspicuous one and very vexatious to the sufferer. Its features are too well known to need description. Every one has seen the bossy, red, almost grotesque appearance which such a nose gives to the countenance. It is difficult to determine whether the point of departure of the hyperplasia is in the glands, the connective tissue, or in the vessels. There is evidently a new formation of fibrous tissue, for the fibrous stroma has not the same structure as the normal derma. The sebaceous glands are also larger and more numerous than usual. There seems, therefore, to be a fresh formation of these, inasmuch as the way in which they are grouped has undergone modification. While a follicle is commonly only provided with two glands, one finds here quite a series of large sebaceous glands perfectly distinct, planted along the whole length of the common excretory duct, some near the surface, others deep down in the neighbourhood of the cartilage. Thus one may see four or five in a single section. There likewise appears to be a process of destruction acting in parallel fashion, commencing by the epidermisation of the glands, which are then destroyed by suppuration or slowly absorbed by the giant cells. Finally, the point of origin of the disease is probably superficial, and the hyperplasia occurs between the epidermis and the base of the follicle, which serves to explain the presence of the glands at such a great depth and the non-recurrence of the complaint after superficial decortication. When hypertrophic acne is only commencing, and has produced no deformity, its treatment merges in that of simple acne. It is merely necessary to avoid outbursts of congestion of the face and suppuration of the sebaceous glands. The flushings are specially due to very ordinary digestive disturbances, connected with errors of regimen or abuse of alcohol. Suppuration is to be combated by antiseptics and preparations of sulphur, of which the first place may be given to pulverisations of sulphurous waters, either at a natural thermal spa or with an artificial sulphur water. In the latter case, half a teaspoonful of a saturated solution of polysulphide of potass is poured into the bottle of an atomiser, and this filled up with water. The act of spraying dilutes this strong solution, and it can be used for five minutes once or twice a day. A marked diminution of the acne pustules is thus obtained. But when the hypertrophy is established, surgical treatment is alone applicable; for though, by other means, the progress may be checked, we cannot hope to cause existing tumours to disappear. Dubreuilh uses mainly the thermo-cautery. The objection that, by it, cicatrices which are too retractile are produced, is not borne out by experience. There is no reason to fear that the destructive effect will penetrate so deeply as to involve the cartilages. Cicatrisation is singularly facilitated by the fact that the hypertrophic masses are deeply penetrated by the sebaceous glands, so much so that excision scarcely reaches their limit. Hence the excretory ducts of these glands, lined with epithelium, form so many centres of epidermic growth. An incision is made by the thermo-cautery, down the median line of the tumour, so as to separate into two halves the whole thickness of the mass. Next, each half is dissected off, a finger inserted in the nose enabling one to gauge the depth. The sides are next attacked, and if by this means modelling is difficult, the surface can be shaved with a bistoury, and the bleeding points sealed with the cautery. Since the wound cannot remain aseptic, a moist dressing with borated water is recommended.

A TENTATIVE SUGGESTION REGARDING THE NATURE AND CHARACTER OF THE X-RAYS.

HEIDINGSFELD (*Journ. Cutan. Dis., incl. Syph.*, New York, January, 1904) formulates a theory, based on Faraday's conception of a fourth state, to those generally accepted—solid, gaseous, and liquid—namely, "radiant matter." This is one to which matter can, under favourable conditions, be readily raised, irrespective of the path of the molecules or its distinction from gases. Thus, accepting Faraday's conception, the X-ray is radiantly active matter, with molecules briskly and easily moving without collision, and this matter, if his theory is correct, consists of small particles of platinum, emanating originally from the anode disc, thrown into a high state of activity by such elements as promote this—high voltage, low ampèrage, and high frequency of the current, high vacuum of the tube, etc. This high activity on the part of the anode platinum disc is evidenced also by its rapid elevation of temperature from a dull red glow to an intense white heat. Completing the hypothesis, the X-ray then consists of minute particles of platinum, in a very high state of "radiant" excitation, emanating from the enclosed disc, and moving radially with sufficient velocity to readily penetrate the circumscribing glass enclosure and all opposed soft and fairly hard substances. Like the "Becquerel" rays, the X-rays impart to any interposed glass, through which they are made to pass, a violaceous hue. Both exercise similar and extraordinary influences on animal tissues, inhibiting pathological growth and disease, inducing depilation and even indolent ulceration and necrosis, in accordance with prolonged action or special idiosyncrasy. The photographic action can be explained on the basis of the physical or chemical effect of the platinum on the silver salt. The difference of hard and soft tubes is easily explained by the relatively greater excitation of the platinum in the hard tube of lower vacuum, and the consequent deeper and greater penetration of the radiantly active platinum, while the more frequent burns from soft tubes can be attributed to the lesser degree of the penetrating power of the platinum and its corresponding more superficial action. The darkening of the tube can be attributed to particles of platinum which are arrested in their passage through the glass walls, and to their gradual accumulation as they become impacted. The darkening, however, is mainly due to the deposition of a metallic coating on the inner surface, the walls when this has been removed only showing a faint violaceous tinge, which imparts a certain degree of additional lustre. It is reported that the X-rays exercise a similar influence upon yellowish and inferior grade diamonds, when exposed to their prolonged action, and impart so much additional brilliancy and clearness, which so materially enhances their value, that their employment in this way is a profitable venture. The therapeutic action can also be attributed to the direct medicinal or antiseptic properties of the platinum, comparable in analogy to silver or other metals, and more effective by reason of its highly radiant state;

necrosis and sloughing, to a relatively more intense action, sufficient to replace stimulation of cell tissue by actual destruction. The confirmation of the theory must entail the absolute detection of traces of platinum, after its escape from the disc to its point of ultimate deposition in or on some object which had been subjected to prolonged action, at some distance from the tube.

ERUPTION FROM MESOTAN.

MESOTAN is a new salicyl preparation, which, chemically, is a methyloxymethyl ester of salicylic acid, and in composition and behaviour resembles winter-green oil, from *Gaultheria procumbens.* It is a clear, yellowish fluid with a faintly aromatic odour, and, mixed with about equal parts of olive oil, seems to be readily absorbed when rubbed on the skin. Within the body it breaks up, so that shortly after its external employment salicylic acid can be found in the urine. It thus appears well suited to replace the internal administration of salicyl preparations, should such be contra-indicated. This has been proved from various observations which Berliner of Aix-la-Chapelle (*Monatsh. f. prakt. Dermat.*, Hamburg, February 1, 1904) confirms, that it has the property of promptly relieving rheumatoid pains. But hand in hand with this, reports have been published of very unpleasant cutaneous troubles following its use, so that care will require to be taken as to the mode of using it. He relates an instance where mesotan was prescribed by a "nature-healer" for pain in the shoulder. After a few inunctions, the patient, æt. 50, experienced, on the parts to which it had been applied, intense itching followed by an eruption. This in part consisted of bright rose-red flat papules or wheal-like areas. In other situations the appearance was of a diffuse reddening with prominence of the follicles, something resembling lichen pilaris. In consequence of the eruption and the unendurable itching, the patient had discontinued the use of mesotan, yet this did not cause it to fade; hence it may be assumed that the drug, when absorbed from the skin, is not rapidly excreted from the system. Since the urine was not analysed, it remains undecided whether it was the salicyl which occasioned, from within, these unpleasant phenomena. Exanthems, succeeding even prolonged administration of salicyl preparations, are rare, so that possibly other constituents of the mesotan combine in intensifying the irritation.

GRANULOSIS RUBRA NASI.

JADASSOHN, in 1901, described a number of cases of a peculiar disease of the skin of the nose in children, to which he attached this name. The essential feature of the affection was a localised erythematous patch on the tip of the nose, dotted over with numerous reddish-brown macules and minute papules, moist and glistening with beads of perspiration, and associated with hyperidrosis of the hands. All the instances he related evidently belonged to the same group, and since then other observers have contributed fresh examples. Macleod (*Brit. Journ. Dermat.*, London, June, 1903) and Audry (*Ann. de dermat. et de syph.*, Paris, November, 1903) have still more recently had cases under their care. In the example recorded by the former, the lesion began at 6 months old, and when seen at the age of 6 years it had persisted with little or no marked alteration. It was said to be more vivid in summer, in hot weather, than in winter, while the redness and perspiration naturally grew more evident after exertion, but not in consequence of emotion. Three months before he was seen, the upper lip became involved, the perspiration preceding the formation of the inflammatory papules. The area of excessive sweating was easily demonstrated by puffing on finely divided charcoal, then dusting it off, which mapped out exactly the moist tract. The surface was scarcely if at all infiltrated, and the papules did not present pores at their apices, nor were they umbilicated. There was but slight itchiness. A portion of skin obtained by a biopsy was too small to give definite results, but Jadassohn and Pick conclude, from their cases, that it is a chronic inflammation, which has its origin in the vessels round the sweat apparatus. Audry regards it as allied to acne rosacea, with essential participation of the sweat glands which play the part of sebaceous glands, these not being active at that age. Treatment so far has been unsatisfactory.

A Tuberous Iodide of Potash Eruption.

The resemblance which some instances of solid eruptions evoked by iodides present to epithelioma, though occasionally observed, has only previously been clearly insisted on by Norman Walker, and now Montgomery (*Journ. Cutan. Dis. incl. Syph.*, N. Y., February, 1904) draws attention to a very marked example. The patient was a man of 52, who fifteen years ago passed through a mild attack of syphilis, for which he only had a short course of specific treatment. Some time after, an ulcer developed on the outer side of the left upper arm, which improved but did not heal under a patent medicine supposed to contain iodide of potash. Another sore, however, broke out lower down, and was succeeded by more, till at last one appeared on the back of the hand. All the time he took a patent medicine of similar nature. The sore extended, others formed on the forehead and vertex, till finally he placed himself under a physician, who gave him iodide of potash openly. Under this the existing sores became worse, and many more came out. About this time it was found that the urinary secretion was not normal. It varied in amount, and while it did not contain albumin or sugar, at times large numbers of hyaline casts were present. A piece was removed from one of the large crusted tumours, prior to ulceration, for examination. Many of the lesions looked like tertiary syphilides, and numerous white scars such as succeed these were scattered over the body. In the diagnosis, dermatitis coccidioides, a disease apparently peculiar to California, was excluded, since no coccidia-like capsulated bodies which characterise it were found in the lesions, nor was it mycosis fungoides. It was therefore regarded as due to the iodide, and when the drug was stopped recovery took place. Though the dose of the iodide he originally took was small, because, as Montgomery remarks, the manufacturers of patent medicines are thrifty and regard amelioration as more profitable commercially than a cure, still, for some reason, the kidneys did not work well, the iodide, not being eliminated, accumulated and caused the eruption. Many of the fields of the sections from the tumour, under the microscope, looked exactly like epitheliomatous infiltration, yet the process took place above the level of the skin, not down into it. No scar was left on healing of the wedge-shaped gap, since the tissue removed was almost wholly pathological growth, scarcely at all involving the normal elements.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

G. H. MELVILLE DUNLOP, M.D., F.R.C.P.Ed.,

PHYSICIAN, ROYAL HOSPITAL FOR SICK CHILDREN, EDINBURGH.

Speech Defects in Mentally Deficient Children.

Dr. Ashby (*Med. Chron.*, Manchester, October, 1903) draws attention to the fact that a very large percentage of mentally deficient children articulate badly or have some marked defects of speech. An investigation conducted in Germany on this subject showed that 14·4 per cent. of the mentally deficient have defective speech, while a similar investigation in Manchester revealed the fact that 19 per cent. of mentally feeble children had well-marked defects in speech, and another 7·8 per cent. had minor defects. M'Leod, who tested the articulation of 10,000 normal children, found that 2·94 per cent. had some form of impediment in their speech. It is tolerably certain that speech defects found in ordinary schools are comparatively slight, but, assuming that there is no defect of hearing, failure to speak, or marked slurring, or baby language, in a child of 5 or 6 years of age, is almost always associated with subnormal intelligence. It is unnecessary to emphasise the fact that any marked articulation defect still further handicaps a slow or deficient child, and renders its future still more unpromising. In considering the causes of speech defects, it is necessary to discriminate between those produced by imperfections in the actual instruments used in articulating, and the far more important question of anomalies of the nerve centres in connection with the organ of speech. By far the commonest naso-pharyngeal anomaly which gives rise to defective speech is a hypertrophy of the adenoid tissue between the pharynx and nose, known as "adenoids." With regard to the cavity of the mouth, the most important cause is a deficient or cleft palate, and even after operation the child speaks for years with a nasal twang. Among other mouth anomalies we have those of the tongue: thus, there may be tongue-tie, large tongues, and thick tongues, which all interfere with clear articulation. In Mongolian idiots and cretins, the tongue is disproportionately large, and such children have a thick slurring speech, but it may be doubted if the large tongue has much to do with it, and it is more probable that the nerve centres which co-ordinate the movements of the tongue are really at fault. Defective speech is sometimes attributed to a high, V-shaped palate. High palates are very frequently noted among mentally deficient children, and are often associated with more or less nasal obstruction. Cases of congenital aphasia are not altogether rare. If a child of 6 years old doesn't talk, or if his words are unintelligible to a stranger, it is tolerably safe to say that he is mentally deficient. The chief defects met with in mentally feeble children are articulation defects rather than a failure to speak. These defects vary, from mispronunciation of a few consonants, to an almost unintelligible mumble. There may be thickness of speech, slurring of syllables, or "scamping" (that is, dropping syllables or words). The term "lalling" is sometimes used to include all the above defects. While marked "lalling" in a child of 6 years is nearly always associated with some subnormal intellectual power, it is needless to say that mental feebleness may be present without any speech defects at all. In some cases of defective speech, where the intelligence is fairly normal, the chief defect may be in the vocal motor centre, but in the majority of cases the child lacks the one thing necessary for action—that is, the power of concentrating his attention, and he has no clear idea of the movement of his vocal cords. A child lacking in intelligence is clumsy in his muscular movements, is not wholly conscious of his mistakes, and makes no effort to learn better. Mentally deficient children are mostly late in learning both to walk and talk; probably there is a late development of the motor centres as well as of the higher intellectual centres. They are frequently clumsy in other movements, as in swallowing.

TWO CASES OF GONOCOCCAL PERITONITIS IN YOUNG GIRLS.

IN *Arch. Pediat.*, N. Y., December, 1903, Northrup publishes notes of two cases of gonococcal peritonitis occurring in sisters aged 11 and 9 years, who occupied the same bed, and in both of whom a vaginal discharge was present, in which gonococci were discovered. The older sister, who had been under treatment for a purulent vaginal discharge, was suddenly seized with acute pain in the abdomen, the tenderness being most marked in the right iliac fossa. There was moderate abdominal distension, vomiting, painful micturition, ghastly pallor, great prostration, and a temperature of 104°·5 F. The symptoms were so rapid and acute, that a surgeon, who was called in consultation, diagnosed peritonitis, due to perforation of the appendix. An operation was performed within six hours of the commencement of the acute symptoms. The peritoneum was everywhere deeply congested, and especially was this marked over the cæcum. Beyond this extreme peritoneal injection there was no obvious inflammatory change, except the presence of a few drachms of liquid serum in the pelvis. The appendix was absolutely healthy. The patient made a good recovery. Eight days later the younger sister was attacked in a similar manner. The symptoms in her case were similar but not quite so severe, and of much longer duration than in the older sister. She was not subjected to surgical interference, and the case completely recovered under medical treatment. In nearly all the recorded cases of this affection, the onset is exceedingly sudden, and there are no prodromata. Pain, tenderness, vomiting, and abrupt rise of temperature announce the onset of this condition. From all the reported French cases one gathers the impression that there is something very characteristic about the facies of children affected with gonococcal peritonitis. The face is described as being pale, drawn, anxious, even agonised, and the nose and lips are thin and pinched, cold and cyanotic. The abdomen is generally distended and sensitive to the slightest touch, but not proportionately so to steadily increasing pressure. The diagnosis of the condition presents considerable difficulty. The chief conditions which require to be differentiated from gonococcal peritonitis are appendicitis, pneumococcal peritonitis, as well as all the other forms of septic general peritonitis. It seems a good rule, when a girl presents abdominal symptoms having an explosive beginning, to examine for vaginal discharge. If gonococci are discovered, operation should be deferred. With regard to prognosis, the great majority of cases recover, though the author records three fatal cases in young children. In many cases, the disease, by causing adhesions, and interfering with the development of the reproductive organs, is the cause of sterility in adult life. The treatment consists in ice to the abdomen, enemata and saline laxatives, and morphine hypodermically for excessive pain. Locally, frequent and effective cleansing and vaginal injections.

REPORTS OF THE MEDICAL SOCIETIES.

◆

Edinburgh Medico-Chirurgical Society.—*March* 2, 1904.—Professor John Chiene, C.B., President, in the chair.—Mr. Stiles showed—(1) A patient after operation for epilepsy, following suppurative leptomeningitis, the result of middle-ear disease; (2) an infant, after ligature of both common carotid arteries for chronic hydrocephalus; (3) two patients after thoracoplasty for empyema.—Dr. W. T. Ritchie showed a man, æt. 41, with pressure symptoms, indicating aneurysm of the transverse portion of the aortic arch.—Mr. Caird showed a patient after jejunostomy for cancer of the stomach.—Dr. C. Watson showed—(1) A woman suffering from exophthalmic goitre of ten years' duration; (2) son of the above, æt. 10, showing symptoms due to alteration in the thyroid and para-thyroid secretions.—Dr. Byrom Bramwell showed a patient the subject of pancreatic infantilism, showing great improvement under the influeuce of pancreatic extract. The patient had gained 5 in. in height and 1 st. 8 lb. in weight since this treatment had been adopted.—Dr. John Thomson showed two cases of infantilism (boys æt. 18 and 24 years respectively) attended with severe dyspepsia and diarrhœa of many years' duration, and probably connected with some morbid condition of the pancreas.—Mr. Stiles showed—(1) The hernial sac of a child containing the vermiform appendix firmly adherent to the testicle; (2) portion of the small intestine resected from a patient suffering from acute obstruction; (3) congenital displacement of the kidneys associated with extroversion of the bladder and sacral teratoma; (4) gangrenous Meckel's diverticulum; (5) two specimens of renal sarcoma from children under 2 years of age.—Mr. Miles showed—(1) Portions of small intestine resected for (*a*) strangulated inguinal hernia, (*b*) strangulated femoral hernia, (*c*) strangulated epigastric hernia. (2) Portions of small intestine resected for traumatic rupture. (3) Three prostate glands removed by perineal prostatectomy. (4) Portion of rectal mucous membrane excised for prolapse of the rectum.—Mr. Alexis Thomson showed the stomach from a man, æt. 47, showing enormous dilatation, the result of pyloric stenosis from ulcer.—Dr. Alexander Bruce read a paper on electrical currents of high frequency, their mode of production and therapeutic applications. Dr. Bruce first dealt with the various modes of producing the currents, and showed the various machines. The high frequency currents are periodically alternating from a high degree of positive to a low degree of negative tension. The frequency of alternation is very high, and the currents owe their effect to this fact. They stimulate both nerve and muscle, and the slower the alternation the greater is the stimulus. In applying them, we utilise the current from the outside of the condensers (which are analogous in construction to the ordinary Leyden jar) which oscillates simultaneously with the current from the interior. The condenser must be charged so rapidly that the effect of one spark has not died down before the effect of the next has begun. Dr. Bruce then described the static machine, and said that to charge large condensers, a machine with about twenty plates is required. Dealing with the various modes of treatment, and their applicability to disease, Dr. Bruce said that up to the present these currents had been used with marked benefit as a general tonic, and also for the relief of pain. They had been used in various neuralgias, the pains of locomotor ataxia, rheumatoid arthritis, acute muscular rheumatism, etc. They are of service in neurasthenic patients, and may enable us to dispense with the Weir Mitchell treatment altogether. So far they had not been found of any benefit in tubercle or carcinoma, but some benefit in cases of sarcoma had been recorded.—Mr. **David Wallace** read a paper on "Chronic Intestinal Obstruction caused by Malignant Stricture of the Large Intestine." The paper was based on a series of ten cases operated upon during the past year. The disease is characterised by very insidious onset, and one may have a very tight stricture in the occluding colon without any symptoms, save some constipation; nothing is therefore done in such cases till actual obstruction occurs. This was the case in six of his patients. The chief symptoms are constipation (which is frequently masked by apparent diarrhœa), pain, loss of weight, and increasing distension of the abdomen. It is uncommon to get a palpable tumour. In four only of the ten cases was a tumour felt before operation. With regard to the site of the tumour, five occurred at the splenic flexure, three at the hepatic flexure, and two at the sigmoid. Speaking of the operative treatment, Mr. Wallace said that, if possible, the operation should be performed during a quiescent period. He advocated an incision in the right rectus, a little to the side of the umbilicus. The three possible ways of dealing with the tumour were—(1) Colectomy, (2) short circuiting, (3) colostomy. The first was the most, the last the least, desirable. If the last be the only possible operation, the artificial anus should be as far from the cæcum as possible, in order to have the fæces as solid as possible. He had done two colectomies, three ileo-colostomies, and five colostomies, with three deaths—one in each group.

Glasgow Medico-Chirurgical Society.—*March* 4, 1904.—Dr. **Chalmers** introduced a discussion on "Infant Mortality." Professor Glaister, Dr. Jardine, and Dr. Ness took part in the subsequent debate. Dr. Chalmers pointed out that, while the general death-rate has decreased markedly within the last thirty years, the infantile death-rate has not decreased in proportion. At the same time the birth-rate has decreased, and this has not been compensated by an increase in the vitality of the children born. Of all the children in Glasgow in 1902 who died under 1 year, about one-third died in the first four weeks of life. This state of matters he attributed to what he called immaturity, *i.e.*, a lack of vitality on the part of the infants. And although the death-rate amongst infants in the better parts of the city was much lower than in the poorer parts, still the proportion of those dying from immaturity was practically the same in both. The cause, therefore, could not be acquired disease or insufficiency of food. Dr. Chalmers also spoke of the frequency of gastro-intestinal disorders as a cause of death among infants, and in this connection advocated the establishment of municipal dairies, where a supply of absolutely pure milk could be obtained. Professor Glaister's remarks were directed mainly to gastro-intestinal disorders as a cause of infantile mortality. He showed that, while in this country the death-rate from such diseases was much higher than it ought to be, a worse state of matters prevailed on the Continent. He also spoke of the greatly increased infantile death-rate in manufacturing as compared with rural districts. Dr. Jardine gave statistics of the Glasgow Maternity Hospital from 1869 up to the present, showing the increasing frequency of maternal rickets. In 1903 one woman out of every seven admitted to the hospital had a contracted pelvis. The children of rickety mothers were healthy, but were adversely affected by the induction of premature labour.

March 18, 1904.—Professor M'CALL ANDERSON showed two cases of lupus, in which the light treatment failed; subsequently treated by tuberculin. Professor M'Call Anderson said that light treatment was unsuitable where the disease was widespread or inaccessible, that it sometimes aggravated the condition, and that relapses were as likely as with other forms of treatment. On the other hand, tuberculin was useful for diagnostic purposes, and almost invariably improved the condition. There was no case of tuberculous disease of the skin, no matter how extensive, for which tuberculin was not suitable.—Dr. W. S. SYME made a short communication on chloride of ethyl as a general anæsthetic in operations on the throat and nose.—Dr. G. H. EDINGTON showed—(*a*) A specimen of undescended testicle with tubercles in the processus vaginalis. There was no evidence of tubercle in the testicle. The general health was excellent. (*b*) Fully descended testicle, strangulated by torsion of the pedicle. The tunica vaginalis was closed. (*c*) Solitary kidney with dilated ureter, associated with malformation of generative organs, ribs, etc., from a case of atresia ani.—Dr. HINSHELWOOD reported a case of congenital word-blindness. The patient, a boy æt. 12, had been at school for seven years, and had had the greatest difficulty in learning to read. He could not read by sight more than two or three consecutive words; otherwise he was quite up to the intellectual average of his age. His vision was normal. The lesion in such cases was in the left angular gyrus. Dr. Hinshelwood recommended frequent and short lessons by himself, as the ridicule of the other boys made him nervous. Since this was begun the boy had made good progress.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*March* 14, 1904.—Mr. MAYLARD, the President, occupied the chair.—Dr. A. N. MACGREGOR showed a specimen of amputation neuromata which he had removed from a stump nine years old, on account of pain and tingling sensations. These symptoms did not develop until eight years after the original amputation.—Dr. J. CRAWFORD RENTON showed—(1) A patient who had suffered from paralysis of the right side of the face for three years, in consequence of mastoid disease. The mastoid was opened and cleared out. Within about a month of the mastoid operation the functions had reappeared, and patient has now completely recovered; (2) a case of Kraske's operation. The patient was æt. 35, female. The tumour, a carcinoma, lay in the middle of the rectum, and was movable and limited in extent. It was readily exposed and removed, and the two ends of the rectum stitched together. The anus was not touched. There has resulted a practical *restitutio ad integrum*. Patient is in perfect health now, ten months after the operation.—Mr. A. E. MAYLARD described a case of gunshot wound of the abdomen. Patient was shot with a small Martini rifle, the bullet entering a little above and to the left of the umbilicus. There was evidence of internal hæmorrhage. Laparotomy was performed. The bowel had escaped perforation, but there were three holes in the mesentery, in one of which an artery of considerable size had been severed. This was secured, and the patient made a good recovery.—Dr. A. N. MACGREGOR showed—(1) A case of venous nævus of the thigh, successfully treated by subcutaneous ligature; (2) varicosity and anastomosis of the superficial epigastric veins, following post-typhoid thrombosis. The vein was ligatured at the left saphenous opening, with the result that the anastomosis has been abolished, the varicosity very sensibly reduced, and patient much relieved.—The Pathological Sub-committee reported that the tumour of the humerus shown by Dr. RUTHERFURD on 11th January was a mixed-celled sarcoma of central origin.—Dr. WORKMAN reported that the tumour of the eyeball accompanying carcinoma of the mamma, shown by Mr. Henry Clark on 11th January, was so necrotic that a definite decision as to its nature was impossible, but he was inclined to regard it as an alveolar sarcoma. Mr. Clark, however, commented on the close resemblance between that form of sarcoma and carcinoma, and remained of the opinion that the growth was rather to be regarded as a metastasis from the mammary carcinoma. There was recurrence in the scar of the breast operation.—Dr. J. CRAWFORD RENTON showed two cysts of the thyroid body, and a periosteal sarcoma of the orbit growing from behind the eyeball.

EDINBURGH
MEDICAL JOURNAL.

EDITORIAL.

The Irish Poor-Law Medical Service.

Is Norway ahead of us in medical relief? Or is "Dublin Castle" in truth deserving of all the strictures passed upon it by the Irish agitator? These and similar questions arise in the mind on reading the report by the special commissioner of the *British Medical Journal* who recently investigated the conditions of the poor-law medical system as it exists in Ireland. We had occasion in our last issue to animadvert strongly regarding the miserable state of our own poor-law medical officers; but that of our Irish comrades would appear to be even less desirable. In one sense they might be expected somewhat to resemble each other, in that the same cause is operative over both fields of observation. The "Celtic Fringe" is always with us, and if one be bold enough to assert that the uncultured Celt is quite unfit to exercise the responsible duty of self-government, we shall find a clue which shall lead us fairly straight to an explanation of the position of affairs. Indeed, one might take up an even stronger position, and quote such authorities as Mr. Bodley and the late Philip Gilbert Hamerton, to show that in France it is not only the uncultured Celt, but even the denizen of Lutetia herself, to whom this axiom might apply. For the same cause has led to the same effect in both the Highlands of Scotland and the south and west of Ireland.

Whilst an educated minority ruled, in the "bad old days," it ruled quite passably well. But the modern spirit swept it away, the reign of the Democracy set in, and all along the "Celtic Fringe" King Demos has proven himself hopelessly unequal to the duties of his high position, at least so far as our luckless medical confrères are concerned. That must be a rotten state of things which is condemned by all classes except the ones responsible for it—by the press, by the teachers in medicine, by the Irish Medical Association, and by priest and layman alike. Yet such is the state of Irish poor-law medical administration. The study of it is very interesting from the broadest point of view. There are those who would see in a comprehensive scheme of State-aided medical relief the best solution of many of the problems which this intricate subject affords. It is more than a dozen years since Mr. Havelock Ellis wrote that "Hospital reform in the future will largely develop around the infirmaries," and here in Ireland we seem to come upon a system which has exactly done so. From the county infirmaries of the eighteenth century to the dispensary system, of the working of which we have such terrible accounts, there is a clear line of lineal descent. And it is only just to say that there does not appear any reason why the system should not, in capable hands, have worked out admirably. There is nothing inherently bad in it. But it suffers from two grave defects. It has Red Tape at its centre, and the Red Ticket at its periphery.

The red tape of "Castle Government" is at the very centre of the system. The pay allowances for each of the wide districts into which Ireland is, for poor-law purposes, divided, averages out at rather under £100 a year. Out of this the medical officer has to find his own trap and horse. His neighbour of the Royal Irish Constabulary, the only living being near him of equal culture, and much beneath him in cost of education, gets allowance to the tune of £95 per annum for upkeep of his horse; so it is evident that, even allowing only five pounds for extras, the expense quite swallows up the entire salary. But Dublin Castle says, "The medical officers have their private practice, we only ask them to take up our work as a side matter." Well must they know that the private practice is worth nothing in that wide expanse of moor and fen. In that poor distressful country, devoid for the most part of any great manufactures, without coal or iron, or any of the industries dependent upon these; with no middle class, or leisured class of any kind—where is private practice to come from, and who should know that better than the government of Ireland? And in another way this red tape tyranny makes itself felt to an exasperating extent. The medical officer's life is made a burden to him—by reason of what, does the reader think? Bottles, returned empties, things that no one in ordinary practice would think of, except as the affair of the shop boy round the corner, these are the means by which a paternal government gauges the capacities of its skilled servants. Not whether a man has good results in his district, nor whether his zymotic mortality is low, his district kept free of preventible disease, his surgical work done under good aseptic conditions. No; the test of efficiency is the way in which his empty bottles are accounted for, his checking and counter-checking of the drug list, the considerate way in which he does not bother them to send him any new-fangled drug which may be engaging attention at the time. These are the marks of efficiency in Dublin Castle. Could red tape be carried to more absurd or more mischievous lengths? It is folly such as this which has killed the medical service of the army. *Mutatis mutandis*, it is eating the life out of the civil medical service of Ireland.

This system of fussy paternal government would be enough in all conscience to wear the life out of a man. But in addition there is the "red ticket" at the periphery of his work. To understand this, it must be remembered that in Ireland there has never, speaking generally, been any middle class at all. There was at one time an aristocracy, which, when it paid any fees at all, paid them by the guinea. If you had no guinea to pay with, you got a dispensary ticket from some one who had one to bestow. And this ticket was either black or red. If black, you went to see the doctor with it. If red, the doctor had to come to you, and any "poor person" might obtain such a ticket. The way in which such a system lent itself to abuse is evident on the face of it, and we believe that during the more acute phases of Irish discontent, and in the wilder districts, this "red ticket" was made a veritable "red terror," an instrument of boycotting in the most cruel fashion. Many and many a loyalist doctor was sent day after day, or night after night, on the "red ticket," up lonely glens and over wild Irish moors, only to find himself on a fool's errand, to visit sick where no sick existed! A "red terror" it was indeed, in those bad old days. Politics are indeed the real curse of Ireland. A man's worth is not judged by his ability as a physician or surgeon, but whether he is a good party man, Orange or Catholic, Nationalist or otherwise, as the case may be. It is this which is the ruin of the system. There are other countries where the same conditions exist, of a poor, sparse population scattered amongst hills and lakes and moors. In Sicily there is a similar system, and it works fairly well. In Norway the general medical service is a state service, and the medical men of Norway are a contented and a respected body of men. The system, then, is one capable of being worked in a manner such as shall give capable skilled attendance to the people by a body of contented, if hard-working men. But not under the conditions which prevail in Ireland. The service must be recast from centre to periphery. It should be set free from the lay official government, and placed under a medical director-general, responsible to the Lord-Lieutenant alone for its proper conduct. More men should be thrown into the congested districts, and horse allowance on the constabulary scale should be permitted. All extra work, such as registration, vaccination, and so forth, should be paid for extra, and the sanitary service should be remodelled and placed on a footing similar to that of the United Kingdom. A wise scheme of superannuation and of holiday leave would add greatly to the relief of the medical staff. The money needed should be easily found in the retrenchment which is to follow the proposed reduction of the constabulary service. And that Ireland will gain by having more and more efficient doctors, and fewer policemen, would seem to be self-evident.

Physical Culture.

LORD ROSEBERY'S now famous pronouncement concerning a "clean slate" has more than a political significance, though the party with which he has allied himself failed to grasp its full importance when Mr. Chamberlain made his patriotic proposition to Sir Henry Campbell-Bannerman, an overture which, had it been accepted, might have saved this country a war, millions of treasure, and many thousands of lives, besides, by the mere act of compliance, handing down his name to posterity as one of the most astute and far-seeing of leaders. One must, however, admit the difficulty which exists of attaining an uninfluenced standpoint, because it is well-nigh impossible to purge the mind of pre-existing impressions. The East, as in far older times, is just now teaching the West what can be accomplished in this way, for is not Japan presenting an object lesson as to what may be done when a clean slate is provided for an intelligent people whereon to inscribe new ideas? The Japanese have shown with what readiness and vigour they can assimilate the very perfection of the Western methods of war; and since among them there is no government by party, all work together for a single end, and unity proves strength. Is it practicable for us to imitate their example and in our turn take a lesson from them? We are led to this reflection from the perusal of a little volume which has just come into our hands.[1] Ages before the advent of Western ideas, the Samurai, the old fighting, two-sworded courtier class among them, possessed a method of developing to its highest pitch the physical capabilities of the body. This was and is known as Jiu-Jitsu, or "Muscle-Breaking," and is now common property and widely practised throughout the nation. We who are wont to think that our energy and vitality are largely ascribable to the amount of animal food we consume, will be surprised to learn that the Japanese, who are the very strongest race on earth, practically eat no red meat at all. The diet which enables them to become so, consists of rice, steamed or carefully boiled, fish, eggs, vegetables in relative abundance, and fruit; their beverages, weak tea without sugar or milk, and pure water, while alcoholic stimulants or narcotics are rarely indulged in, unless we regard the lactucarium in lettuce as a narcotic, since this constituent of salad is freely partaken of. Water, indeed, is imbibed abundantly, as much as a gallon being swallowed daily in divided doses. With us it is too much the habit to avoid drinking water, unless when impelled by thirst; in fact, there are numbers of persons over whose throat this liquid, in its simple unadulterated form, never passes from week's end to week's end. The Japanese have discovered that habitual flushing of the system, through the medium of the kidneys, exercises a most beneficial action, while they bathe and cleanse the exterior of their bodies to an extent undreamt of here. One might have thought that the advantage which accrues to a gouty man, with clogged tissues and muscles, from the copious draughts of water prescribed at any fashionable spa, would have suggested that the same fluid employed at home, in modified fashion, might do away with the necessity of a yearly visit to his favourite *kurort*. But no; on his return, he resumes his old habits, and eats freely when hungry—or when, according to the time of day, he ought to be hungry, and drinks with meals, but seldom else, unless over his cigar or pipe in the evening, and then not water unblended. Another,—and perhaps this is the usage on which they lay the greatest stress,—that deep, habitual, forcible inhalation of fresh air is an essential for the acquisition of strength, and this is sedulously practised till it becomes a part of their nature. The heart is strengthened by the practice of exercises of resistance, groups of muscles are put in action by the will, which at the same time inhibits their contraction. Thus, the arms are forced up while the effort of raising them is restrained by volition; in this way a muscle and its antagonist are, as it were, pitted against each other, and perfect and well-balanced development results.

---

[1] "Japanese Physical Training," by H. Irving Hancock. G. P. Putnam's Sons, New York, 1904.

Hutton, the bone-setter, communicated to Wharton Hood the secret on which the so-called art of the fraternity is based. This consists in finding out a painful spot, really an adhesion left behind from some previous inflammation and exudation, fixing this by digital pressure, and then sharply and forcibly bending the joint. The adhesion, if the movements were properly executed, gave way, and the stiff articulation was rendered more or less completely movable, more especially at the moment, for, so treated, the rigidity was apt to reassert itself in course of some hours. But the Japanese have found out that, by firm pressure on certain accessible nerves in proximity to bones, the limb supplied by these can be for the time paralysed; and when the muscles of the assailed are thrown into a state of tension, in their reaction against the compression, severe pain succeeds. Thus the attacker can at once render his opponent *hors de combat*, unless he, by previous knowledge of the trick, understands how to make the assault harmless. By a gradual process of toughening the edge, the hand becomes so resisting that blows which immediately disable can be dealt with ease and certainty. The art of self-defence has been elaborated to a degree of perfection in Japan, yet with it there has been evolved a winsomeness and evenness of temper which make for peace. In fact, as Mr. Hancock shows, this system of exercise, diet, and general mode of living, has made the Mikado's people the healthiest, strongest, and happiest men and women in the world.

The General Medical Council and its Final Examination Reports.

In view of the near approach of the Final Examinations in Medicine in the University of Edinburgh, the reports by the Examination Committees appointed by the General Medical Council to inspect the final examinations of other Universities and Examining Boards are not without interest.

The reports before us are those dealing with the Universities of Dublin, Oxford, Durham, London, Cambridge, the Victoria University, the Society of Apothecaries, and the Royal Colleges of Ireland and London. As it goes without saying that the reports are in the main complimentary, we need only point out those points whereon the visitor and the inspector were not altogether satisfied.

Dealing with these reports in their chronological order, the examination committee appointed to deal with Trinity College, Dublin, does not seem to have been overpleased. Two candidates who had been rejected in medicine applied to the Board for re-examination in the subject. This request, greatly to the astonishment of the examination committee, was granted, and, still more to their astonishment, both the candidates passed at the re-examination, although one of them could not test urine for albumin! Commenting on this, the inspectors state "such a procedure, on the part of the authorities of a body granting medical qualifications, is open to grave objection." The Committee appointed to criticise the inspector's reports was even more dissatisfied than the inspector, for it "desires to express its opinion that no candidate should be allowed to pass any qualifying examination who is unable to carry out such an elementary clinical investigation." Another point in which the report dealing with Dublin expresses its dissatisfaction is, that the "candidates are not always examined orally in the presence of two examiners."

The Irish Royal Colleges appear to have given the utmost satisfaction to the inspection committee, as it reports that "the examination is a fair and carefully conducted one, and that, as regards its sufficiency, it fulfils the requirements of the Medical Act."

It is a little surprising to find that the Oxford Final Examination, "as a whole, was not sufficient." It would appear that the "examiners in medicine are inclined to be too lenient in clinical work." There is "no special examination in opthalmology and operative surgery, there is no routine examination in surgical anatomy," and finally, the committee states that "if the Oxford Scheme of General Medical Education is the best, that laid down by the General Medical Council must be wrong; and if the scheme of this council is good, the Oxford scheme is not one to be sanctioned."

The Victoria University, prior to its disruption, gave much satisfaction. The examination is described as "sufficient and of a high standard." The clinical examination is regarded as "most satisfactory, and all the arrangements worked perfectly. It was evident that the examiners required a high standard of proficiency."

The Durham University report is also satisfactory, but it brings out one very striking feature, namely, that after the written examinations an interim meeting of examiners is held to give their awards, "when five out of the original twenty-three candidates were rejected, and eighteen only were allowed to proceed to their *vivâ voce* examinations. This committee is disposed to look favourably upon the practice just described, and it commends the question of its more general adoption to the consideration of the licensing bodies."

The University of London, like Oxford, is full of surprises. "The examination in surgery is not such as would secure the standard of efficiency in that subject that is required by the General Medical Council." The chief reason for the dissatisfaction herein expressed is apparently the discrepancy between the marks allotted to the written examinations as against those given to the orals, thus a candidate passes in surgery with 190 in his paper and only 50 in his clinical and oral combined! The committee states that the "Examiners should not lower the value of the degree of M.B. by giving marks to the practical, clinical, and oral parts of the examinations which are only half the value of the marks for a written paper, and when such marks would probably not pass a candidate at another Licensing Body, where clinical and practical work are estimated at a higher value than they appear to be at the University of London. If the degree is to be regarded as an honour degree, rather than as a licence to practise, the necessity of maintaining at least as high a standard in the practical part of the examination as in the literary ought to be observed."

The University of Cambridge is eminently satisfactory. "The final examination is of a high standard, every part of it is well thought out and skilfully conducted, and the surgical examination possesses some features which are well worthy of close consideration." The Final Examination of the London Royal Colleges appears to have given much satisfaction. "The examiners appeared to the visitor and inspector to set the standard of marking rather high," and further, "there was not the slightest hitch or delay in any part of the examination, and, considering the large number of candidates that were examined, the organisation that ensures such results must be looked upon as perfect."

We desire to ask the following questions, suggested by our knowledge of Edinburgh and the perusal of the reports previously mentioned:—Are special examinations legal, and if so, are they granted on sufficient grounds? Is there any special examination in surgical anatomy, either in the University or in the Fellowship Examination of the Royal College of Surgeons of Edinburgh? Are candidates always examined orally in the presence of two examiners?

The Amenity of Edinburgh.

THE LORD PROVOST OF EDINBURGH has recently expressed some strong views on the subject of making Edinburgh more attractive. His aim, without doubt, is laudable, and so far we are in sympathy with him; yet it is open to question whether some of the methods he advocates are really calculated to bring about the result he desires. Orchestras in the gardens, bands in the parks, coloured minstrels at Portobello, and similar amusements, are all well enough in their way, but they savour more of Blackpool or Douglas than of the "Grey Metropolis of the North," and we cannot regard with equanimity the possible advertising of the city of Scott and Jeffrey and Cockburn as a place where the giddy tripper may have twelve hours of continuous amusement for sixpence.

We frankly admit that the civic authorities appear to be trying to do something for the amenity of the city. They have actually, at last, under the pressure of the public health and sanitary officers, managed to hit upon a device whereby there will probably be some diminution of the rubbish and garbage so long a characteristic of the Edinburgh streets. Yet it must be confessed that it would certainly recompense any farmer to go round at midday and sweep, say such a street as Princes Street, for the fertilisation of his soil. Even in this direction, much indeed remains to be done. In muddy weather not a crossing-sweeper is to be seen, and the patient inhabitants wade through greasy, sticky sludge; in dry seasons the water-carts may be counted on the fingers of two hands, and the wind-blown pedestrian is enveloped in a toxic dust; when a snowstorm occurs, the municipal machinery is stricken with absolute paralysis, and private endeavour, enforced by police regulations, has to remove the dingy covering of the pavement.

There are some other points, however, to which we hope the civic fathers may turn their attention after they have carried out the cleansing reforms to which they have set their hands. Edinburgh is probably the noisiest city in the United Kingdom. The granite cobbles with which its streets are paved, loosely set, so as to obtain the maximum of jolting as well as the climax of noise; the ingenious arrangement of hub and axle resulting in a triumphant clashing with every movement of a heavy laden cart; the whirring of subterranean wheels, and the clanging peal of tramway bells, as if a parade of fire-engines were in progress; the absolute licence permitted to shrill-voiced newsboys and raucous-toned coal-sellers, to say nothing of every type of itinerant musician—these and many other sources of noise production result in an ear-splitting combination which we may safely defy the world to emulate. For the man or woman of nervous constitution Edinburgh is indeed a woful city. It is often an absolute relief to get away from its jarring and jangling din into the soothing and subdued murmur of the English metropolis, where, with infinitely more business, there is considerably less noise. If the Edinburgh Magistrates and Town Council really wish to render the city more habitable, let them at once start to repave the streets and regulate the traffic, so as to reduce the multifarious dissonance to proper dimensions.

We do not desire them to attempt to beautify the city, but we wish they would prevent the jerry-builder from defacing it. Its own natural beauty has been almost proof against the ill-considered efforts of successive generations to improve upon it. Like Lydia, our own romantic town seems to best advantage when *simplex munditis,* and we would prefer the absence of meretricious adornment. Something, however, must be possible in the way of averting the disgraceful attempts of the speculative builder from defacing, for the sake of filthy lucre, what is intrinsically a beautiful city.

ORIGINAL COMMUNICATIONS.

THROMBOSIS AND ACUTE GANGRENE IN STRANGULATED HERNIÆ.[1]

By Edred M. Corner, M.A., M.B., B.C. (Cantab), B.Sc. (Lond.), F.R.C.S. (Eng.), *Surgeon to Out-Patients and the Physical Exercise Department, St. Thomas's Hospital; Assistant Surgeon to the Hospital for Sick Children, Great Ormond Street, London.*

The name gangrene is one which has been used for many, many years. But very few know that it is derived from a Greek word, *γραίνω*, to gnaw. From the original meaning, therefore, it is most applicable to such processes as ulceration, suppuration, phagedæna, etc., that is to say, the death of small particles or molecules. Unfortunately, it has become usual to apply it to the "death of visible portions of tissue," and, in consequence, is understood to imply the death of large parts, such as limbs and parts of limbs. The common meaning of the word, then, is very different from its original significance. Gangrene frequently covers also the putrefactive processes which occur after the death of the tissues. The old names of sphacelation and sphacelus refer to the separation of the dead from the living tissues, *i.e.* the process of sloughing, and the slough of dead tissue cast off.

The mere fact that a tissue is possessed of life presupposes that it must die. When the whole body dies the process is called death, not gangrene. When a part of the body dies it should be called local death. Adopting the customary use of Greek phraseology, these two catastrophes may be called general or total necrosis, and local or partial necrosis. This is the more exact nomenclature, though it will be a long time before the word gangrene is expunged from our text-books.

Death or necrosis is the natural end of all living tissue. When it occurs as a general dissolution of the body, the death of the parts is bound up with that of the whole, and no attention is paid to them. But the untimely death of a part does attract attention, no matter when and where it is. Our text-books take ample consideration of the death or gangrene of limbs. In these lectures I shall endeavour to bring together examples of the untimely death or necrosis of different parts of the alimentary canal, and to show that the tissues there are subject to the same laws of life and death as are those elsewhere, the differences in the results being due to the differences in the situations in which the necrosis occurs. Broadly speaking, there are two forms of death, one which is followed by drying or mummification, and the other followed by wetness and decomposition, which, when local, are erroneously termed dry and moist gangrenes or gnawings. The dryness and moistness are important physical conditions. But a much more important distinction is the aseptic (relatively so, to judge from results) and the septic necrosis or death, the former being dry and the latter moist. I have termed this septic condition, when in the alimentary tract, "infective necrosis."

---

[1] A section of the Erasmus Wilson Lectures, 1904.

ACUTE INFECTIVE NECROSIS IN STRANGULATED HERNIÆ.—In the *St. Thomas's Hospital Reports* for 1900, published in 1902, I wrote an elaborate paper on the occurrence of gangrene in strangulated herniæ, in which it was endeavoured to show the relationship which exists between the results of interference with the blood supply of the ensnared bowel and those of the action of micro-organisms. The great importance of the latter agent was emphasized by the recording of a case in which gangrene or necrosis of the bowel occurred in an example of strangulated femoral hernia within twenty-four hours of the onset. This class of gangrene, or better, acute infective necrosis, as it is due to the action of micro-organisms, was likened to an attack of gangrenous appendicitis, or the perforation of a gastric ulcer. The study of the pathology of these hernia cases led to the application of the same principle of infective necrosis to the acute diseases of other parts of the alimentary tract, and so to the formation of the subject-matter of these lectures. I do not intend to reproduce the subject-matter given in that paper, on account of the large amount of other material to be dealt with in this course. But since that paper left my hands, further facts which bear on the subject have come into my possession. These I shall put before you, and so now merely enlarge on the work already published.

The practical importance of the subject of acute infective necrosis of the bowel is very great, both in its influence on the treatment and the diagnosis; besides, it changes the prognosis very considerably, though, if recognised and treated properly, the prospects are on the whole very good. As this subject is one which is of much interest, a great deal of attention has been paid to it. It must be confessed that I have seen some patients submitted to the more severe operation of resection of the bowel and anastomosis, both at home and abroad, who never required that operation at all. And again, in a prolonged study of the literature, the same point has struck me. And though I am urging the early and wide resection of the bowel and anastomosis in cases of acute infective necrosis, I must confess that the statistics and statements in the literature on the subject are, even to a far larger extent than may be thought, quite unreliable. The gut which one surgeon regards as gangrenous is deemed recoverable by another, and who is to judge?

In order to aid a better selection of cases, the signs of gangrene are reproduced from my paper, by which, I believe, this acute infective necrosis is recognisable, and are contrasted shortly with those ordinarily given for its recognition in strangulated herniæ. In this way I hope to define the position which has been taken up, so as to avoid the slur, to put it mildly, of excessive surgical zeal.

The bowel in these cases is dark or black in colour, the stricture is so tight that, in the production of the strangulation, both arteries and veins may be almost or even completely and simultaneously occluded. Two things result from this: First, the sac almost invariably contains little or no fluid; and, secondly, the gut is not œdematous or doughy, as is taught. On the contrary, it is thin, inelastic, and does not recover its shape when deformed, as it easily is. Its surface may glisten, as the empty condition of the vessels interferes with the inflammatory dulling or glazing of the peritoneum covering it. It contains blood, if the initial vascular strangulation has been incomplete; no gas is present within its lumen, having been absorbed by the extravasated blood. There may be signs of local peritonitis on the sac rather than on the bowel, as evidenced by dulling, glazing, etc., or a perforation of the bowel may be present. This necrosed bowel differs very markedly from that ordinarily described, on account of the different methods of its production. The necrosis is the result of the combination of tight strangulation and the subsequent action of micro-organisms. The above-described signs are evidences of the former factor almost alone. Examples are given in the paper in the *St. Thomas's Hospital Reports*, 1900, pp. 347–349, which illustrate the following clinical types:—(1) A local infective peritonitis in the hernia sac without gangrene of the gut, due to the diapedesis of organisms. (2) A general infective peritonitis after the reposition of the bowel in the abdomen and without gangrene of the strangulated loop, also due to the diapedesis of organisms. (3) The occurrence of general peritonitis and gangrene of the strangulated loop, after the return of apparently healthy bowel to the abdomen. (4) The occurrence of gangrene of the bowel in strangulation of intestine, both internal and external to the abdominal cavity, within twenty-four hours of the onset of symptoms. (5) The spreading character of this pathological process. (6) The greater tendency of the necrobiotic process to spread upwards, *i.e.* in the distended bowel above, rather than downwards in the collapsed bowel below, the strangulating agent.

To the first of these illustrations I have little noteworthy to add, and so, to save time and space, will pass on to the third point at once. The case in which gangrene occurred after the apparently healthy piece of bowel at the operation had been returned to the abdomen, is so emphatic and remarkable that it is worthy of reproduction:—

CASE 1.—*Case of acute infective necrosis in a strangulated femoral hernia.*—A woman, æt. 42, was operated on for a femoral hernia of the right side which had been strangulated twelve hours. The knuckle of small bowel looked in perfect condition, in every way, to be returned to the abdomen. It was of normal consistence, elasticity, shiny peritoneal coat, and so forth. In fact, according to the views which were then held, there was not a moment's doubt as to its being replaced in the abdomen. On the fourth day after operation she died. Dr. Stacey Coleman, who performed the autopsy, showed me the coil which had been ensnared, completely gangrenous.

This instance was the first of the kind which I had met with, and the occurrence of gangrene of the bowel after twelve hours' strangulation offered much food for meditation and reflection.

In the first place, I believe the necrosis was due to the action of micro-organisms, but a secondary phlebitis, and consequent thrombosis of the mesenteric vessels, may have played a part, which may also have been due to the micro-organisms. The vessels were certainly not completely occluded at the time of the operation, as the bowel quite distinctly improved in colour after the edge of Gimbernat's ligament had been divided, and the constriction relieved. The thrombosis most probably had origin in a vascular inflammation or angeitis; that is to say, the involvement of both arteries and veins, probably due to the action of organisms which have migrated from the bowel. So far as is known, thrombosis of vessels, after the reposition of the loop of intestine in the abdomen, is far from common; but there are always a certain number of cases in which the gut has been so returned and subsequently becomes gangrenous. Little attention has ever been given to these cases, as the post-mortem examinations are usually conducted by physicians, and surgeons are apt not to lay stress on these fatalities.

In the paper in the *St. Thomas's Hospital Reports* to which I have so often referred, a table was constructed showing how often this occurred (p. 361), and is reproduced here:—

Variety of Hernia.	Number of Cases.	Number in which the Gut became Gangrenous after its return to the Abdomen.	Percentage.
Inguinal . . .	212	7	3·3
Femoral . . .	181	16	8·8
Umbilical . .	44	3	6·8
All Varieties . .	437	26	5·9

It is not possible to hazard a suggestion as to whether these are due to mistaken diagnoses made at the operation, or to a subsequent phlebitis and thrombosis of the vessels in the mesentery involved by the strangulation.

As I wish to direct special attention in these lectures to the instances of acute infective necrosis, I would like to mention a few more cases than the two of my own which have already been recorded (*St. Thomas's Hospital Reports*, 1900), in which necrosis occurred in the bowel within twenty-four hours of the onset of strangulation:—

1. A woman, æt. 64, had a femoral hernia which had been strangulated for less than twenty-four hours; reduction was effected by taxis, the gut necrosed, and the woman died.
2. A woman, æt. 52, had an umbilical hernia which had been strangulated for eleven hours. Reduction by taxis. Death resulted from peritonitis, due to necrosis of the gut involved.
3. A woman, æt. 59, had a femoral hernia which had been strangulated for twenty-four hours; reduction by taxis, subsequent perforation, necrosis of the gut, and death.
4. A man, æt. 59, was operated on for a strangulated inguinal hernia which had presented symptoms for fifteen hours; the gut was reduced and a "radical cure" performed. Death resulted from subsequent necrosis of the bowel and early peritonitis.
5. A woman, æt. 70; femoral hernia, strangulated under twenty-four hours; resection of bowel and anastomosis; death.
6. A woman, æt. 64; umbilical hernia; strangulated twenty-four hours; artificial anus; death.
7. A woman, æt. 44; ventral hernia; strangulated twenty-four hours; resection and anastomosis; death.

The above cases have been taken from the *Surgical Reports of the Middlesex and University College Hospitals*, in order to show that gangrene of the bowel can occur within twenty-four hours' time at other hospitals than St. Thomas's.

They are fatal cases, as most are, otherwise they would have found their way into other literature than Hospital Reports. It is also of interest to note that three out of the seven were instances in which the strangulated hernia had been reduced by taxis.

Table of Times at which Gangrene was found in a Strangulated Hernia at St. Thomas's Hospital.

Days of Strangulation.	Number of Cases.
Under 1 day	2
1–2 days	11
2–3 "	13
3–4 "	8
4–5 "	11
5–6 "	11
6–7 "	2
Over 7 "	9

Gangrene was found in 6·1 per cent. of inguinal herniæ, 19·5 per cent. in femoral, and 25·4 per cent. of umbilical herniæ. It occurred in 14·2 per cent. of all cases operated on. Acute infective necrosis of the bowel is therefore not a common disease, if defined as the gangrene occurring within twenty-four hours. In the above it forms only 3 per cent. of gangrenous herniæ, a percentage which is, in reality, far too small to represent any but the most acute action of the micro-organisms. It would therefore not form 1 per cent. of all strangulated herniæ.

In the following table, an attempt has been made to form a list showing the frequency of the occurrence of gangrene within twenty-four hours of the onset of the strangulation of herniæ at St. Thomas's, the Middlesex, the University College, and St. Bartholomew's Hospitals, and Bruns' and Maydl's kliniks abroad.

Table of Gangrenous Herniæ showing the frequency of Acute Infective Necrosis.

	Number of Gangrenous Cases within Twenty-four Hours.	No. of Gangrenous Herniæ.	Percentage.
St. Thomas's Hospital .	2	67	3
Middlesex ,, .	3	12	25
University Coll. Hospital	6	33	18
St. Bartholomew's ,,	2	28	7
Hofmeister ,,	7	27	25
Michel ,,	3	54	5
Total	23	221	10

It is interesting to note that the school, St. Thomas's Hospital, from which the material was obtained for these lectures, and which same material directed attention to this condition of acute infective necrosis, shows the lowest percentage of its occurrence! And the figures from Hospital Reports are those least biassed by the personal equation of the recorder.

If we now turn to the literature, which has been largely, though not completely, overhauled, it was found that the reported case in which gangrene was found earliest was that of Nové-Josseraud. It occurred in the left inguinal hernia of a young man, with a congenital sac associated with an imperfectly descended testis. Twelve cms. of the small bowel were resected; anastomosis, followed by recovery. The duration of the strangulation was only seven hours, and the symptoms were most acute. Michel reports a fatal case in a woman of 68, who had a strangulated left inguinal hernia of eight hours' duration. That is to say, a fatal case of only one more hour of strangulation in an old woman, than in Nové-Josseraud's successful one in a young man.

Besides the case reported in my paper, already quoted in the *St. Thomas's Hospital Reports*, 1900, pp. 358–360, I have operated on another, also successfully, which was associated with an imperfectly descended testis, as was that of M. Nové-Josseraud.

Case 2.—*Case of strangulated inguinal hernia, acute infective necrosis of the small bowel, resection and anastomosis; recovery.*—A man, G. E., æt. 29, was admitted to St. Thomas's Hospital on the 26th of June 1902, with most severe pain in a left strangulated inguinal hernia of twelve to sixteen hours' duration. There was an imperfectly developed testis on the same side. He had known of the hernia for fifteen years, and had worn a truss, but as the hernia had not been down for a "long while," it was discarded. It was the first time the rupture had reappeared when he was brought to the hospital. At the operation the sac contained a very little fluid. About 6 in. of small intestine had been suddenly expelled from the abdomen, the amount expelled causing immediate and tight strangulation of the loop. The intestine was full of blood, showing that the occlusion of the vessels had not been complete at once. The blood within the bowel had absorbed all the intestinal gases. Owing to the distension of the coil of gut, it had twisted on itself, completely occluding everything. The gut itself was thin, sticky, and inelastic; not œdematous, doughy, or offensive. The vessels in its mesentery were thrombosed. About a foot of gut was removed, the resection being most free above the obstruction. An end-to-end anastomosis was made with two layers of continuous silk stitches. The testis was underneath the gut, and had a half twist on its spermatic cord. The gland was excised. A radical cure was performed with fine salmon gut. On the second day an enema yielded a good result of flatus, and on the fourth day another enema gave a large fæcal result. Feeding by mouth began on the fourth day. Healing *per primam.*

When once this necrotic, necrobiotic, or necrogenous process gets a good start, it may extend, especially up the bowel, in the part above the constriction. I have already mentioned and illustrated this tendency to extend, in the *St. Thomas's Reports*, 1900. It is not easy to find records of cases in which gangrene has occurred after resection, as in Hospital Reports they escape notice, and surgeons do not publish them themselves. Nevertheless, Mr. Hewston[1] has recorded one in a woman of 65 years of age, for whom he resected the small gut in a right femoral hernia, which had been strangulated four days. The resection had been to all appearance free. But, post-mortem, the bowel was gangrenous for an inch above the line of suturing. There is no record of a case in which the gangrene spread downwards to any extent sufficient to cause any trouble in treatment. It is important that the surgeon should bear in mind this pathological point. Professor Kocher of Berne some years ago, pointed out that it is not the amount of gut resected which kills the patient. It might almost be added that it is usually the insufficient resection of the gut which causes the fatal result; an anastomosis having been performed on tissues which were teeming with organisms. Mr. Barker[2] strongly advocates a wide resection. Mr. Makins, in the *Clinical Society's Transactions* for 1903, has advocated rather extensive involution of doubtful bowel wall in these cases. And, later, it has been emphasized by Dr. Crampe of the Königsberg Klinik.[1] This is a most suitable and successful measure in suitable cases, as both authors have shown. But its applicability diminishes as the action of micro-organisms over the results of interference with the blood supply increases. Therefore it will be inapplicable in cases in which gangrene has occurred within a few hours of, or shortly after, the onset of strangulation; whilst it will be most suitable in patchy gangrene about the site of the constriction of the gut, and not in œdematous parts of the loop. It is a measure far more applicable to doubtful pieces of gut, as Dr. Crampe has urged, rather than those in which gangrene has already declared itself.

---

[1] This case was read to the South Hants Branch of the British Medical Association, at Winchester, 1902, under the presidency of Dr. David Browne.

[2] *Lancet*, London, 1903, vol. i. p. 1576.

THROMBOSIS OF THE MESENTERIC VESSELS IN STRANGULATED HERNIÆ.—The association of thrombosis of the mesenteric vessels with the strangulation of a hernia I have observed several times, and am also sure that it is not always a matter of great importance. Professor Kocher of Berne told me that he lays great stress on the presence or absence of pulsation in the arteries of the mesentery of a knuckle of strangulated gut, in judging whether or not the bowel can be returned to the abdomen. If the pulse is absent, he prefers to resect the intestine rather than run any risk in returning it. Since then I have made many examinations of such mesenteries, and have been frequently unable to find any pulsation, and yet no evil has resulted from the replacement of the bowel in the abdominal cavity. Presumably, therefore, occlusion of the vessels, of a temporary nature, is frequently present, and does not necessarily cause gangrene of the bowel. And, again, resection of the gut is not necessarily needed when that arterial pulse is absent. Again, this thrombosis may be associated with perfectly recoverable bowel, as will be seen later. And there is still more to be learned.

In two or three instances, whilst doing a "herniotomy," the mesentery has been "cut or torn" in the process; the bleeding vessels, once an artery of some size and therefore of some importance, ligatured, and the rent sutured. These cases did uniformly well. In one of them, in which the mesentery was noted to be loaded with fat, there was scarcely any bleeding. Thinking this over afterwards, it seemed that the vessels were thrombosed, so explaining the fact that no hæmorrhage resulted from the tear. In all these cases the rents were more or less perpendicular to the long axis of the bowel, the obliquity only involving a small length on a line parallel with the same axis. So that, at the most, only half an inch of the bowel had its blood supply interfered with. The suggestion that, at least in the last case, the mesentery tore, and was not divided by the herniotomy knife, is strengthened by the following example, in which a previously thrombosed and fatty mesentery tore with the greatest ease:—

---

[1] *Beitr. z. klin. Chir.*, Tübingen, 1903, Bd. xxxviii. Heft 2.

Case 3.—A woman, C. M., æt. 63, was admitted to St. Thomas's Hospital on 27th July 1902. She had known of the presence of a right-sided femoral hernia for a year, which had now been strangulated for thirteen hours. The pain and the vomiting had been very severe. At the operation, the sac contained a little bloody fluid and a large loop of small intestine, which, though a little dark in colour, was obviously returnable. Gimbernat's ligament was incised, and gentle traction applied to the bowel. But, try as one would, the mesentery kept separating from the intestine, and in spite of great care, and a second and freer "herniotomy," 4½ in. of bowel were denuded. There was no hæmorrhage, the vessels being thrombosed. About 7 to 8 in. of the bowel were resected, and the ends united by a circular enterorraphy. A radical cure was then performed. Beyond the occurrence of a hæmatoma, in the situation from which the large fatty hernia sac had been removed, the convalescence was without incident.

This case definitely proves the existence of a thrombosis of the mesenteric vessels in a strangulation of medium severity of thirteen hours' duration. But one of the most interesting points is, that the bowel looked quite good, and if the mesentery had not been torn, would undoubtedly have been returned to the abdomen. If it had, what would have happened? In the light of the above sections of this lecture, the patient might quite well have recovered, an anastomotic circulation becoming established; or, on the other hand, the gut might have necrosed. The result would have depended on the pathogenicity of the organisms present, secondary extension of the thrombus, etc.

Since the above case, I have become cognisant of a paper by Thevenot and Patel,[1] on the tearing of the mesentery in strangulated herniæ, of which, with some difficulty, I have succeeded in obtaining a copy. They report one case of their own, in which a successful resection of the bowel was performed in consequence of the tearing of the mesentery. The duration of the strangulation before operation was twenty-four hours in a right femoral hernia; and the bowel, small intestine, was apparently healthy. M. Dransart[2] has recorded two similar cases. M. Colle's unpublished case occurred in a man, 66 years of age, who had a right inguinal hernia, which had been strangulated only six hours. Thevenot and Patel associate the extreme friability with the fattiness of the mesentery, as was so in the case which I have recorded at length. M. Jaboulay[3] regards it as due to congestion, œdema, and inflammation; and, I would further like to add, thrombosis of the vessels and the consequent loss of tone and weakening of the tissues.

As in my case, the gut in that of Thevenot and Patel looked

---

[1] *Arch. Prov. de Chir.*, Paris, 1901, tome x. p. 340.

[2] Thèse de Lille, 1896–1897, No. 36.

[3] "Traite de Chirurgie," Le Dentu and Delbet.

quite healthy; so did also that of M. Colle. This is an extremely interesting point. And, as far as one is able to judge, vascular thrombosis is far more frequent in strangulated herniæ than is suspected, and the more commonly gives rise to no trouble whatsoever; the most important proviso being the absence of septic organisms. These cases illustrate that the blood supply of small segments of the bowel can be completely cut off without producing sloughing of that tissue.

ARTERIAL DEGENERATION.

By Guthrie Rankin, M.D.Glasg., F.R.C.P.Ed., *London.*

The arteries being physiologically related to every tissue of the body, their inflammatory and degenerative disorders possess more than local importance, while their pathological relationships extend far beyond the limits of the vessels themselves.

Disease of the arteries is specially associated with morbid processes of a degenerative type; hence the truth of the aphorism, that "a man is only as old as his arteries." It depends upon a large variety of causes, of which the most important are syphilis, gout, alcoholism, lead-poisoning, mechanical overstrain, the infective diseases, and senility. The situation of the disease is in some cases determined by the cause. Thus, gout produces its most marked arterial changes in the vessels distributed to the kidneys; syphilis, in the vessels of the brain; and mechanical strain, in the larger arteries, particularly the aorta.

Clifford Allbutt differentiates three forms of arterial sclerosis—(1) *Toxic*, the effect of lead-poisoning and of certain infective diseases; (2) *involuntary*, the result of senile decay; and (3) *secondary*, the consequence of arterial hyperpiesis. Though these varieties differ, from the point of view of causation, their symptoms are so interwoven that clinically they closely resemble one another.

The three tunics—the intima, the media, and the adventitia—which compose the arterial walls may, each or all, fall under the influence of inflammatory processes, which are partly degenerative and partly regenerative. It is important to remember that in the aorta the intima is thicker, and the adventitia thinner, than in the smaller arterial vessels; that in the brain the arterioles are enveloped by a perivascular sheath; and that a congenital smallness of the arterial system—hypoplasia—is conspicuously associated with chlorosis.

Degenerative changes occur most frequently after middle life, and are specially apt to happen in those who follow laborious occupations, who have lived freely, and who have contracted or inherited syphilis. Certain families display an unaccountable tendency to early arterial decay.

The acute forms of arteritis are not common; they mostly arise, when local, from inflammation in the neighbourhood of an artery, or from infective embolism such as often occurs in malignant endocarditis; and, when general, from such specific diseases as influenza, enteric fever, or acute rheumatism. The chronic varieties are the most important, and derive their interest mainly from the complex pathological condition of atheroma, in which so many of them terminate.

By some authorities atheroma is regarded as a morbid condition totally distinct from arterial sclerosis. Pathologically it may be so, but etiologically they are closely allied, and clinically they can seldom be differentiated. In many instances, the one is the direct consequence of the other.

No vessel is exempt from the possibility of degenerative change, but those that suffer most frequently are the aorta, the coronary arteries, and the arteries at the base of the brain. The gastric, hepatic, and mesenteric vessels usually escape.

An artery, the walls of which have become degenerated, is hard and resistant; it is of large calibre, its tension is increased, and, to the naked eye, it is prominent, tortuous, and locomotive. So far as the deeper vessels are concerned, the diagnosis of their condition can only be a matter of inference; but the occurrence of otherwise unexplained disturbance in an organ should always suggest that similar changes to those visible in the superficial vessels have become established in its capillaries and arterioles.

In every case of advanced atheroma, the aorta is involved. This is manifest by abnormal dulness over the manubrium sterni; pulsation in the episternal notch, or in the second right interspace; and a muffled systolic murmur, followed by an accentuated second sound in the aortic area.

In consequence of increased peripheral resistance, the heart is hypertrophied, especially the left ventricle.

Most chronic forms of arteritis are probably associated with an altered quality of the blood. This is often dependent upon impaired metabolism, which in its turn is frequently due to toxæmia. Huchard's contention, that there is a prodromal stage in which increase in peripheral resistance is the result of irritative spasm, without actual organic change in the vessel walls, is therefore not unlikely, and is worthy of attention, because it indicates a primary stage during which much may be done to arrest or delay the degenerative process. When sclerosis is once established, it is incurable, and always tends to be progressive. In spite of it, the patient retains good health, as long as the cardiac hypertrophy is sufficient to counterbalance the increased peripheral resistance; but he is all the while living on the brink of a precipice, over which the most trifling occurrence may suddenly project him.

The organ or tissue in the vessels of which the disease process has advanced furthest is obviously in greatest jeopardy. Dangerous developments are specially to be feared in the heart, brain, kidneys, lungs, or lower extremities.

1. HEART.—The compensatory hypertrophy of the left ventricle, to which reference has already been made, is a physiological provision for maintaining the equilibrium of the circulation under pathological conditions. It does so successfully, often over a period of many years, but the compensation may fail at any moment; and though this is brought about by many causes, none is more frequent than advancing atheroma of the coronary arteries, in consequence of which the cardiac walls are inadequately nourished, and subsequently undergo fatty or fibroid changes. The ventricle soon fails to overtake the resistance in front; it empties itself imperfectly, and so there arises increase of internal pressure, which, acting upon softened walls, leads to dilatation with all the evil consequences of backward obstruction consequent upon such a catastrophe. A slow or arhythmic pulse, with occasional slight attacks of dyspnœa and pain in the chest, is always suggestive of coronary implication in a patient who is the subject of thickening and tortuosity in his superficial vessels.

Besides dilatation, other serious cardio-muscular phenomena are liable to follow. Of these the most important are—

(*a*) *Coronary thrombosis.*—This may occur at any time, though it is most frequent in advanced stages of atheroma. It is often responsible for sudden death.

(*b*) *Aneurysm of the heart.*—The degenerated myocardium may, under the influence of a very slight strain, yield at some specially weak point. An aneurysmal bulging results, of which there may be no symptoms until death suddenly occurs from rupture into the pericardium.

(*c*) *Angina pectoris.*—There is no difficulty in recognising this condition when it presents the classical signs of sudden præcordial anguish, pain radiating down the left arm, inability to lie down, and a terrifying sense of impending death. But in milder cases the præcordial distress is less pronounced, and, if not carefully investigated, is too often misinterpreted and erroneously attributed to rheumatism.

(*d*) *Stokes-Adams disease.*—In this rare condition, the symptoms referable to the heart are accompanied by phenomena referable to the brain. All the cases so far recorded have happened in patients of advanced life with atheromatous vessels. The pulse-rate is always phenomenally low — usually between 20 and 30, and occasionally even under 20—and is associated with recurrent cerebral attacks, which are, in some instances, vertiginous in type, in others syncopal, and in others again epileptiform. They are liable to be induced by slight exertion, or by any other circumstance which adds to the work the heart is called upon to do, and they are never followed by paralysis or other important sequelæ. The pathological explanation is, probably, degenerative disease, simultaneously involving the arteries responsible for the nutritive supply of the heart and of the medulla.

(*e*) *Aortic aneurysm, or valvular disease.*—The symptoms of both these conditions are well known, and, though inaugurated by various other causes besides atheroma, become, sooner or later, associated with retrograde changes either in the walls of the aorta or in the cusps of the valves.

2. **Brain.**—Cerebral symptoms are many and various. The loss of elasticity and partial occlusion of the arteries of the brain, together with the enfeebled action of the heart, predisposes to cerebral anæmia. At first this is temporarily induced by physical effort or mental excitement, and may produce only a passing vertigo, monoplegia, hemiplegia, or aphasia. Vertigo is a specially common symptom, and may be either simple, or accompanied by a permanent slow pulse and intercurrent syncopal or epileptiform attacks (Stokes-Adams syndrome).

As the arterial disease increases, it tends to produce a more chronic and permanent type of anæmia, which is manifested by mental apathy, irritability of temper, tremor, slurred speech, loss of memory, and headache of varying intensity,—a combination of symptoms closely resembling those met with in general paralysis. In still more advanced stages, degeneration of the cerebral vessels becomes responsible for—(*a*) A constant risk of hæmorrhage, from rupture of a miliary aneurysm. Such a rupture may occur anywhere, and the consequent symptoms will vary according to its situation, but the lenticular artery more frequently yields than any other, and the consequence is hemiplegia. And (*b*) cerebral softening, from necrosis of tissue throughout whichever area is deprived of its vascular supply by occlusion of the vessels distributed to it.

3. **Kidneys.**—Renal symptoms supervene in a large number of cases of arterial disease, and correspond to those we are accustomed to associate with chronic interstitial nephritis. The urine is abundant, of low specific gravity, contains an intermittent trace of albumin, and is liable to become deficient in urea. The general health continues good, even over many years, but the patient is never free from the risk of an acute nephritis or of uræmia. It is often impossible to be sure whether the arterial or the renal disease is the primary pathological event; either seems to be capable of producing the other.

4. **Lungs.**—The pulmonary symptoms which accompany arterial degeneration are those indicative of bronchitis and emphysema, with all the concomitant dangers of right heart failure.

5. **Limbs.**—Atheromatous changes in the vessels of the lower extremities, especially in the popliteal and tibial arteries, are

responsible for the development of senile gangrene, which is often preceded by persistent and obscure anasarca of the ankles and legs. The tissue changes which are produced by chronic arterio-sclerosis often terminate in fatty and calcareous alterations in one or more of the arterial tunics. The vessels become hard, inelastic, and tortuous, and their walls are the seat, first of proliferative and afterwards of degenerative processes. The pathological sequence of events is thus succinctly described by Mott:—"It is primarily defective metabolism and strain. Physiological compensation—that is, increased functional activity of the left ventricle to overcome the increased peripheral resistance in the arterioles and capillaries—ensues and leads to hypertrophy of the muscular structures engaged, and to dilatation of the elastic aorta and large arteries. In the second stage, there is thickening of the vessel wall, mainly of the intima, proportional and compensatory to degeneration of the muscular and elastic tissues. In the third stage, the compensation process fails, so that, should the patient escape the danger of cerebral hæmorrhage, he may succumb in the final stage to blocking of his coronary arteries and consequent cardiac failure. Herein the general deficiency of nutrition, which alters the whole metabolism of the body, leads of itself to the failure of the physiological compensation which had been set up, and the insufficiently nourished muscular structure of the heart is unable to overcome the resistance in front. Dilatation of the left ventricle then follows, and mitral regurgitation, congestion of the lungs (frequently emphysematous), and dropsy, partly cardiac, partly due to changes in the capillary walls and the hydræmic condition of the blood, complete the vicious circle."

Arterial degeneration has established relationships with so many varieties of disease, that it cannot be looked at, from the prognostic point of view, as an independent affection. The outlook is always most hopeful for those who are sufficiently well off to be able to shake themselves clear of occupations which involve mental or bodily strain, who can escape from the rigours of cold and inclement weather, and who, at the same time, are sufficiently disciplined to make good use of their leisure and to avoid excess of all kinds. When there is evidence of tissue changes in the brain, heart, kidney, or other organ, the prognosis is rendered thereby correspondingly grave. The more extensively distributed such evidence is, the more numerous are the dangers by which the patient's daily life is beset.

There is no difficulty in recognising arterial sclerosis when it has become developed in the superficial arteries. The occurrence of functional organic disturbances justifiably warrants an inferential diagnosis of arterial disease when the vessels which come within reach of physical examination are manifestly thickened. Persistent increase of arterial tension is significant of commencing organic changes in the vessel-walls. A hard, resistant, tortuous temporal or radial artery throws a flood of light on the probable immediate cause of an apoplectic seizure, or on such cerebral symptoms as vertigo, ephemeral aphasia, loss of memory, mental dulness, or persistent headache; on such cardiac symptoms as dyspnœa, præcordial pain, anginal attacks, or palpitation; on such nephritic symptoms as a copious secretion of pale urine, of a low specific gravity, containing occasional traces of albumin; on such pulmonic phenomena as emphysema, breathlessness, and cyanosis; and on such peripheral symptoms as coldness, blueness, and ultimate gangrene of a limb.

The following points may be noted as of prominent diagnostic importance:—

1. The patient is past middle life or bears the stigmata of premature senility.
2. The superficial arteries are hard, prominent, tortuous, and locomotive.
3. The pulse is resistant, of high tension, of a variable rhythm and of diminished amplitude.
4. The heart is hypertrophied, especially the left ventricle. The second aortic sound is accentuated, and, if dilatation takes place to any degree, a systolic murmur becomes established either at the apex or in the left auricular area.
5. Organic manifestations are frequent and diverse. They vary according to the seat of maximal distribution of the diseased vessels.
6. There is, in a large proportion of cases, a history of syphilis, alcoholism, or physical strain. In many, the patient pleads guilty to all three.
7. There may be a family history of gout or of some other constitutional instability, which conduces to imperfect metabolism.

In the matter of treatment, the first recommendation which should be made to a patient suffering from degenerated arteries is that he should avoid stress of all kinds. He should lead a quiet and uneventful life, curtail his business responsibilities, avoid every form of dietetic excess, and take a reasonable amount of exercise in the open air. Alcohol is contra-indicated, and if taken at all, must only be indulged in with meals and in small quantity. The food should be varied and simple, and red meat is best minimised, especially in patients of a gouty diathesis. The bowels must be thoroughly evacuated once a day, and a course of simple tonics—quinine, arsenic, strychnine, phosphorus, iron, the mineral acids, etc.—given now and again to promote the maintenance of nutritional activity.

Apart from these general principles, each case must be dealt with according to its special indications. When anginoid attacks follow on vertigo and dyspnœa, and are accompanied by a high tension pulse, the patient should be kept in bed, fed on simple food, and ordered the following mixture, three or four times in each twenty-four hours:—Iodide of sodium, 10 grs.; solution of nitro-glycerin, 1 per cent., 2 minims; Fowler's solution, 3 minims; decoction of bark, 1 oz. He should also have 1 gr. of calomel at bedtime, every night for a week, followed in the morning by a sufficient dose of sulphate of soda or sulphate of magnesia to ensure a satisfactory result. If compensation has broken down and there is evidence of cardiac dilatation, digitalis should be given, and its constrictive effect upon the arterioles may be counteracted by combination with nitro-glycerin; tincture of digitalis, 15 minims; solution of nitro-glycerin, 1 per cent., 1 minim; solution of strychnine, 5 minims; peppermint water, 1 oz. This mixture should be taken every six hours, until the regularity of the pulse becomes re-established; it may then be continued in half doses until the pulse-rate has become normal, when it should be replaced by some such combination as this pill:—Reduced iron, 4 grs.; extract of strophanthus, $\frac{1}{4}$ gr.; strychnine, $\frac{1}{30}$ gr.; extract of rhubarb, $\frac{3}{4}$ gr.—To be taken three times a day after meals. Stimulants are necessary, as a temporary measure, and are best given in the form of champagne or brandy, in such amount as the necessities of the condition demand. If the cardiac failure has gone so far as to produce engorgement of the liver and lungs, with dyspnœa, cough, and cyanosis, venesection should be adopted without hesitation, either by the abstraction of 8 or 10 oz. of blood from the median basilic vein, or by the application of eight or ten leeches over the tender edge of the liver.

The treatment of cerebral manifestations, aneurysm, thrombosis, renal disease, emphysematous bronchitis, gangrene of the limbs, etc., must be carried out on general principles, but with a full appreciation of the leading etiological relationship in which arterial degeneration stands to each and all of them.

If it be borne in mind that persistent increase of tension in the arterial system is the constant forerunner of changes in the vessel walls, something in the way of preventive treatment may be possible of achievement. The patient should have his position fully and candidly set before him, and ought to be made clearly to understand that his future health is very much in his own hands. A life of careful and uneventful regularity, frugal meals with special moderation in the nitrogenous elements of food, freedom from excess of work and worry, and the maintenance of the ordinary bodily functions in normal activity, will do much to stave off the evil day of incurable atheroma. Where there is a clear history of syphilitic infection, short courses of iodide of potassium and mercury should, from time to time, be prescribed. If such a patient desires to give himself the best chance of a long life, he ought to abstain wholly from alcohol and tobacco. Note should be periodically taken of his pulse, and any excess of tension reduced by a few evening doses of calomel and a short course of iodide of sodium and nitro-glycerin.

THE RELATIONS OF THE INSANITIES TO CRIMINAL RESPONSIBILITY AND CIVIL CAPACITY.

By SIR JOHN BATTY TUKE, M.D., F.R.C.P. Ed.; and
CHARLES R. A. HOWDEN, M.A., *Advocate.*

(*Continued from page* 333.)

V. THE NATURE AND LIMITATIONS OF MEDICAL EVIDENCE.

IN the preceding papers we have merely glanced at a few of the most prominent points in the psychology of insanity; but even this brief consideration is enough to show that the legal problems which arise must necessarily be of the most obscure and complicated nature. In criminal questions, the law, as we have seen, simplified the matter very much by refusing to take into account anything but intellectual capacity. It was enough if the criminal knew that his act was forbidden and punishable; everything else was covered by the assumption that he was able to stop and consider before he acted. What may be the ultimate nature and value of this assumption does not lie within our province to inquire; but we see, at least, that it depends on certain conditions, which in sane life are continually varying, and which in the case of the insane may be so completely altered that the assumption cannot hold good. The natural balance of the influences which determine the action of sane men is entirely changed. On the one hand, the restraining influences are weakened. The insane may be incapable of comprehending the consequences of their acts, or their knowledge may be so dim and uncertain that its effect is scarcely appreciable. Even if it appears that the knowledge which would have restrained sane men lies within reach of their intelligence, so that it can be elicited by examination or by concentrating their attention, the power by which the sane voluntarily arrest the course of thought and turn it into relevant channels, and by which they check the impulse of passion or feeling, may be wholly or partially in abeyance. On the other hand, we find positive states of excitement, which exercise an abnormal influence upon thought and action. Feelings, emotions, and desires may, as we have seen, rise to an unknown pitch of intensity. Actions may be determined by ideas which stand in a peculiar relation to morbid excitement, and are sometimes strengthened and intensified by sensory hallucinations. Such influences may be separated theoretically and be ranged in various categories; but in the concrete case they exist in hopeless complication; and to bring them in their result to anything like an exact comparison with the ordinary standard of liberty of choice is an impossible task. In many cases, of course, we see clearly that the essential conditions which enable us to determine our action are entirely wanting, and these present no difficulty; but in others we perceive that there is a certain power of reflection and self-control still left. In such cases we cannot say, with any kind of precision, how much this power differs in degree from that possessed by ordinary men, and we cannot ascertain directly the strength of the forces which impel an insane character to action, nor the relative weakness of the restraining power. We can only conjecture by their results how far these conditions diverge from the mental states with which we are acquainted. To what extent we must presume this divergence to be carried, before we can exempt the subject from the ordinary legal responsibility, is a question which must be discussed in connection with the separate province of law; but, in the meantime, we must look at some general considerations which affect the manner in which the existence and extent of insanity ought to be investigated.

According to the old practice, which, although occasionally modified in the direction to the jury by individual judges, has by no means fallen into desuetude, the court concerned itself simply with the case before it, and sought by obtaining evidence as to conduct and character to ascertain how far it differed from the ordinary type. When we look into the evidence of insanity, adduced in the earlier reported cases, we find that the proof, both of its existence and the extent to which the mind was affected by it, was almost always derived directly from the mental peculiarities alleged to be exhibited in the individual case. The question appears to have been, on the one hand, whether a man who did or said certain things could be considered sane enough to be responsible; or, on the other hand, whether his sanity and responsibility were not sufficiently established by direct proof of intelligence and capacity. The judgment founded on such evidence, and pronounced by a court unskilled in medicine, amounted to nothing more than that a sufficient difference was recognised between the case before it and any type of sane men with which it was acquainted. If the differences were palpable, and lay well within the sphere of ordinary observation, the judgment of the court would probably be sound enough. In a case, for instance, which involved nothing more than an easily demonstrable deficiency of the understanding, such as could be gauged by everyday experience, and which in relation to the issue existed at a definite period, judgment might be pronounced on the mere statement of facts, and the production of skilled evidence might be supererogatory. Such uncomplicated cases are found in practice to be very rare. As a rule the natural history of each case demands review, and this can only be arrived at by advancing medical evidence. Medical evidence only becomes of value when it is founded on definite knowledge. When it amounts to nothing more than conjecture, based upon the anomalous character of the phenomena presented in a given case, it cannot reasonably be allowed a preponderating influence, even in determining the mere existence of morbid mental conditions. So far as that is concerned, the physician and the lawyer are on common ground.

The value to be attached to medical evidence, in determining the nature, degree, and especially the intensity of the mental disorder, depends upon the definite character of the class of cases to which it may be referred; in other words, it depends on the fulness of the natural history of each class. It would be useless to tell the court that a case belonged to a particular class, if the character of that class is so vague and uncertain that no fair inference can be drawn as to the mental nature of the particular cases which are comprehended under it.

These defects of evidence were conspicuous at a time when the medical knowledge of insanity was more confused and uncertain than it is at present. Large classes of cases were connected by nothing but loosely defined psychological characters, under which almost any case might be included which presented a superficial resemblance. No doubt these classes were founded upon genuine cases of insanity, and the clinical skill and experience of their originators was a guarantee against their being unduly extended in their hands; but the descriptions found in text-books were so general in their terms, as to render definite application to individual cases difficult or impossible in the hands of medical men unacquainted with the subject, who were apt to refer to one or other class any anomalous case whose peculiarities seemed reconcilable with some individual feature. Moreover, certain of these classes really represented novel aspects or theories of insanity, and those who advanced them were inclined to seize upon any case which could be used for their extension, without paying special regard to the nature of the proof. The medical evidence offered in many of these cases was often of the loosest description, and was frequently based upon nothing more than some incidental likeness, and the generally inexplicable character of the case. Even if it were admitted that the case was of the kind which was asserted, the admission did not go very far, for the group was probably so loosely put together that it contained an infinite variety of cases. Moral insanity, for instance, came to comprise every morbid deviation that could possibly be brought under that name, including many that were so slight that they could scarcely, if at all, be distinguished from the ordinary type; and homicidal mania comprehended numerous different kinds of insanity which ought to be proved by different symptoms, and became so loose and indefinite that experts occasionally seemed to think they were entitled to apply the designation whenever they failed to discover a sufficient motive for the murder. This style of proof has now, to a large extent, disappeared; but still there are classes of insanity the evidence regarding which must always remain more or less liable to such defects. We cannot deny that there is a limited class of cases, the evidence for which approaches so nearly to conjecture that lawyers are justified in regarding it with a certain amount of distrust, especially, as in some instances, it may rest upon a theory which the witness may be inclined to push beyond reasonable probability. Such cases also present so great a diversity of type, and occasionally shade so imperceptibly into conditions of sanity, that their relationship does not always enable us to draw conclusions as to the nature and extent of the mental affection, to the same extent as in the majority of instances. We are often thrown back upon very general points of view, which must necessarily be used with the greatest caution.

In this connection we may recur to the distinctions we have already drawn between different classes of cases. In the case of disease, properly so called, in which a previously healthy subject is affected by the incidence of a morbid process, its symptoms are, as a rule, so clearly marked that it is scarcely possible for a skilled physician to mistake the case. In such cases the diagnosis is almost as certain as in any ordinary bodily disease. The individual cases of the different groups present a general similarity of type; they may be of a graver or a lighter character, but they are, to say the least, so related one to the other by their history and general characteristics, as to render weighty presumptions derived from general experience. In all such cases the opinion of the physician ought to supersede ordinary evidence, more especially in the initial stages and in transitory attacks; for in these instances the general evidence often fails entirely to show the nature of the case, and some of the most important symptoms may readily be attributed to other causes. Even in those civil cases in which the whole question at issue is simply the capacity to transact some particular piece of business, which seems to be proved by the fact itself and the relatable circumstances, we must still have recourse to skilled evidence in order to be certain that the appearance of intelligence is not superficial, and that the act is not done under the influence of some insane motive. The same is true with regard to the chronic stages which often succeed an acute attack. In many instances the new character continues so long unchanged, and discloses itself so patiently, that no difficulty is experienced in judging of the case. The changes may be apparently slight, and yet a very considerable extent of derangement may be almost entirely concealed; and, at the same time, such cases are frequently liable to sudden and inexplicable returns of excitement. Such uncertain manifestations can only be interpreted by study of the history of the case, and by knowledge of the general effect produced by the disease which is the primary cause.

Looking back on older reported cases, we see clearly that many persons were convicted and sentenced who would not now be held responsible, even under the strictest interpretation of the law.

The reason is, that we have partially, but not completely, come to understand the value of other lines of evidence than those formerly laid down as guiding the court. It is now generally, but not invariably, admitted that in a question of insanity the most important evidence may not be that which shows patently its divergence from the normal condition, but that which connects it with other cases, the nature of which has been elucidated, and on which light has been thrown by extensive experience and study. It is only by the recognition of the value of such methods of inquiry that we have come to appreciate the influence and possible results of the less obvious insane mental states; and in some instances, at least, the result of the change is very apparent. No one, for example, can estimate the number of epileptics who have been executed for murder, before the comparatively recent knowledge of the various aspects of the disease was acquired. We can readily imagine that, until this had been gained, the plea of unconsciousness—one of the symptoms of epilepsy—at once so complete and so difficult to prove, would scarcely be listened to by the court, in the face of the evidence of crime accompanied by violence. In the early stages of general paralysis of the insane, diagnosis and prognosis can with almost absolute certainty be based on signs which, taken by themselves, would not make the slightest impression on a jury. The cases of melancholia, which at one time appear to have afforded numerous victims to ignorance, are now becoming so generally known, that when once the court is satisfied of the nature of the case it is rarely necessary to go further.

In these and many other instances a more intelligent view of insanity has led men to prefer the knowledge derived from a wide experience of similar cases to that which can be gathered from the apparent differences from the ordinary type presented by the case itself. The same applies to every case of insanity of any difficulty. The nature of the insane mental phenomena points clearly to the conclusion that we cannot adequately appreciate them, except by a knowledge of a large number of similar cases. We cannot, as we have already said, fully understand them, because they are alien to our own mental experience. In ordinary life we can imagine the mental conditions which preceded an act, either by the effect which their apparent causes would have produced upon ourselves, or we guess them from the results. But, in the case of insanity, the former line of evidence is wholly useless to us, because the morbid mental states are produced either by some physical cause or by a mental antecedent which would have produced a different effect in a state of health. We can only measure their influence by their expression, either in act or speech, and whenever these manifestations do not clearly exhibit the force and intensity of the morbid mental states from which they sprang, we must obviously interpret them, not by our knowledge of sane human nature, but by our experience of similar morbid conditions.

We are thus naturally led to the conclusion that the most valuable evidence in a difficult question of insanity is not that which is derived from a direct estimate of the mental peculiarities of the individual case, but, as in every other case of disease, from the symptoms, as interpreted by our knowledge of other cases. So far as the mere existence of disease is concerned, this as a general proposition is too clear for discussion. The only doubt of it arose at a time when men regarded insanity as a purely mental peculiarity, the existence and nature of which fell to be determined by psychological knowledge, a view which even yet, perhaps, is sometimes unconsciously held. But, granting the disease to be established, it seems equally clear that, in so far as its effects do not appear patently on the surface, their elucidation must also be derived from experience. If, as is often the case, the external indications afford no measure of the actual disorder, but are only symptoms from which its nature and extent are to be inferred, their interpretation is quite as much a matter of special knowledge as the bare existence of the disease itself. To recur to the example of a crime committed under the influence of a state of depression, we find that not merely the existence of the disease is frequently ignored by the unskilled, but that, even if it be admitted, they are quite unable to appreciate the influence exerted by the morbid state of feeling. In many such cases we stand imperatively in need of special skill, both to show that the feeling is the result of disease, and that it is entirely different in its intensity and nature from the extreme depression of sane men.

As a general rule, therefore, the most important evidence in any case of difficulty is that which establishes its relation to some well-known type of insanity, and such evidence must of course always rest on the opinion of skilled medical men. No one would venture to deny this, were the question at issue one relating to the existence or gravity of any other form of disease; but, from the causes to which we have already referred, expert evidence has been held in peculiar suspicion in cases of insanity, and we must therefore consider certain limitations and grounds of suspicion to which it may fairly be held to be subject.

There are unquestionably certain limitations to the use of expert knowledge, which naturally arise from its character and source. The strength of the expert lies in the fact that the case belongs to a type with which he is familiar, and that the symptoms which show the case to belong to that particular type enable him to infer a great deal more than could be detected by direct examination. We cannot, of course, expect that in every individual case he is able to estimate the exact extent to which the mental liberty is impaired. He is a better trained observer, and has ranged his facts in a more systematic fashion, than the ordinary witness; but to a large extent this evidence is of the nature of an inference. It is a deduction from experience, which cannot be expected to be more than approximately accurate when applied to each individual case.

When, therefore, we have direct evidence applicable to the point at issue which is intelligible to every one, and there is nothing in the case that is occult or concealed, expert authority is not of the same value as it is in obscurer cases. There are numerous cases, partly weak-minded and partly eccentric, in which the only question involved is the amount of deviation from the normal mental standard, or the capacity of a person to understand some particular act, or to look after his own interests, and in which there is ample evidence of character and conduct. We find frequent instances of this kind when wills are contested on the grounds of mental weakness or eccentricity; and still more frequently in those commissions in lunacy, when the point in dispute is simply the degree of business capacity. In such cases the task of determining how far the mental character falls below or deviates from the ordinary standard, is not one which belongs specially to the physician; and his opinion is often inferior to that of shrewd men of business who have had better opportunities of personal knowledge. His judgment in these cases is founded on evidence which is intelligible to every one, and there is no reason why any particular weight should be attached to it, when it is founded on no more recondite facts than questions which test the patient's capacity for arithmetic, and similar experiments on his understanding. In great cases, like Windham and Dyce Sombre, the medical evidence was almost worthless, because the witnesses had really no data to go on which were not equally available to the court and the jury.

But further, there are undoubtedly cases in which expert evidence must be received with caution, not because in these cases there is no advantage to be derived from special knowledge, but because the medical opinion rests on grounds which the court may be entitled to regard as unsatisfactory. A bare guess is not enough for a court of law. The medical opinion must be a diagnosis which is founded on definite and sufficient grounds. In order to be completely satisfactory, it must rest upon symptoms which connect the particular case with a class of cases which are otherwise known. A physician who simply tells us that a case is one of insanity, without being able to tell us more, is in the same position as one who should tell us that a person is unwell, without being able to say what is the matter with him. Even in such a case the trained eye might more readily detect a deviation from health, and so far his evidence might be of greater value than the ordinary observer's; but still, it would rest upon grounds which were common to all, and could claim no separate and exclusive authority. Medical evidence becomes of paramount authority only when it is founded on definite knowledge. When it is nothing more than mere conjecture, based upon the anomalous character of the phenomena, we cannot reasonably allow it a preponderating influence even in determining the mere existence of morbid conditions.

The cases in which medical evidence, and indeed evidence of any kind, is apt to become most uncertain and unsatisfactory are to be found in that class, almost wholly congenital or hereditary, in which the mental phenomena are due, not to a distinctly marked morbid process, but to conditions of defect or degeneration. We have already observed that in the cases of permanent defect, which is shown by imbecility or weakness of understanding, medical evidence is of comparatively subordinate value. There are, however, a large number of cases of hereditary defect which stand in quite a different position. In these cases the intelligence seems to be comparatively intact, and their morbid nature is shown sometimes in delusions or fixed ideas, sometimes in strong phases of morbid excitability, or in perversions and defect of feeling. We cannot understand these cases without the help of special knowledge. Their morbid character is often concealed, or is masked by the general appearance of intelligence; it may only appear clearly at intervals, or be elicited by special circumstances, and its most patent marks may readily be attributed to mere depravity or folly. In such cases the expression of trained medical opinion is necessary, notwithstanding that the quality of such evidence is not of such a high order as in those in which diagnosis rests on demonstrable pre-existing disease. Theory, however well founded (still theory), is more apt to be imported into the equation. The value attachable to proof of the existence of hereditary predisposition in a given case may be in question, as also the diagnostic value of stigmata of general nervous instability. Nevertheless, the production of such evidence in systematic form should always command the respect of the court, as it may be essential to the formation of judgment.

(*To be continued.*)

VARIATION IN ITS RELATION TO THE ORIGIN OF INSANITY AND THE ALLIED NEUROSES.[1]

By JOHN MACPHERSON, M.D., F.R.C.P.Ed., *Commissioner of Lunacy in Scotland.*

LECTURE II.

MENTAL DEFECT.—Mental defect, used here in its broad sense, means a congenital variation characterised by the partial or complete absence of one or more of the numerous faculties or subfaculties which we recognise in the normal human being, child or adult. The absence of these faculties is wholly or in part correlated with the development of the physical organisation, especially with that of the nervous system; and it is rare to meet with imperfect congenital structure of the nervous system, in the absence of other imperfections of the body. These other imperfections of the body are technically known as physical stigmata. They are the visible signs of the nervous imperfections. It is acknowledged on all hands that the more grave the incidence of the mental defect, the more numerous and the more pronounced are the physical malformations. Thus, as we pass up through the scale, from monsters to idiots, imbeciles, and the higher class of the latter, we find a gradually diminishing number of bodily malformations, quantitatively and qualitatively, until they disappear altogether, and we emerge upon the apparently normal plane of the race, so far as regards mental functions and bodily structure.

---

[1] "The Morison Lectures," delivered before the Royal College of Physicians, Edinburgh.

Besides the physical stigmata, there are certain well-recognised mental stigmata or signs, such as the neuroses, epilepsy, hysteria, alcoholism, chorea, and the various tics and obsessions which are the outward manifestations of underlying defects in the nervous system, especially the brain. Although we know that every functional peculiarity must have an underlying organic basis, we are very far from a knowledge of the intimate correlation between function and structure. When we attain to that knowledge we shall have advanced infinitely beyond our present standard. The most important attempt to correlate mental power with the structure of the cortex cerebri has been made by Dr. J. S. Bolton, writing in Motts' *Archives of Neurolgy* for 1903. No doubt the observations are as yet unconfirmed, but whether they are subject to great alteration or not, the credit is due to Dr. Bolton of having made the first serious step in a direction which opens up a vista of endless possibilities. His research is mainly anatomical into the depth of the various cortical layers in mental disease. His results in effect are that the pyramidal layer (second layer) of nerve cells in the prefrontal cortex varies inversely with the degree of amentia or dementia present in each case. The pyramidal layer of the cortex cerebri is the last layer to develop, and it is the first to undergo retrogression in dementia; it is the only layer which appreciably varies in depth in normal brains; the degree of its development in normal infants and in congenital aments varies directly with the mental power of the individual, and the degree of its retrogression in demented patients varies directly with the amount of existing dementia.

Mental defect may be due to two causes, namely—(1) To an inherent incapacity for perfect development latent in the embryo or germ cells; and (2) to the mental development having been arrested by extraneous causes acting *in utero* at the time of birth or in early childhood. I am unable to say, even approximately, what the proportion of these two classes may be to one another. Tredgold, in a very able paper,[1] places the first at 90 per cent. and the latter at 10 per cent., but I rather think he places intra-uterine affections of the fœtus among the first.

Basing then upon the correlation of mental with physical defect, I shall pass rapidly in review some of the various forms of non-viable and viable monsters, and then proceed to a description of some of the graver physical anomalies which are found among idiots and imbeciles. In the course of the remarks, reference will be made to their occurrence among the lower animals, among primitive savages, and in early historical times; as occasion requires, remarks will also be made as to their hereditary transmission, the occurrence of twinning, and the relative proportion of the sexes. I desire that attention should be given to these remarks, as, though apparently scattered and irrelevant, they bear the burden of my argument.

[The various forms of single monsters were here described and illustrated by slides. Emphasis was laid upon their occurrence among all species of the higher animals, upon the frequency with which they are twin-born, and upon the preponderating number which were of the male sex.]

A FEW OF THE CHIEF PHYSICAL ANOMALIES OF IDIOTS AND IMBECILES.—*Dwarfism.*—Of all the anomalies that associate themselves with mental defect none is so common as low stature. Gigantism is frequently correlated with intellectual feebleness, but its occurrence, compared with dwarfism, in this relation is rare. Dwarfism is often due to rachitic deformity of the lower limbs, but apart from that its characteristic association with idiocy is sufficiently striking. Dwarfs are met with in every race and in most orders of animals and plants. Historically, the references to them are constant. From the time of the Roman emperors down to the African potentates of the present day, they formed a part of the interesting entourage of Courts. Catherine de Medici made frequent attempts to rear a race of dwarfs from the numerous specimens, male and female, at the French Court, but her efforts were futile, for the variety being pathological was infertile.

Hermaphrodism.—Hermaphrodism occurs normally in most flowering plants, very commonly among the invertebratæ, and as an abnormality among the vertebratæ, including man. The numerous references to this abnormality in ancient literature show that it has been commonly observed in all ages of the race. Home, quoted by St. Hilaire, records a case in a Mandingo negress; and Clark, quoted by Home, stated that similar abnormalities were common among the negroes of Mandingo and Ibbo.[2] A perfect example of bisexual hermaphrodism in the ape was recorded by Harlan[1] in 1835. The subject was a young gibbon, caught in Borneo and brought to New York in 1826. Here we have one of the most complete examples on record, occurring in an animal descended from a stock which was neither domesticated nor deteriorated by the enervating effects of civilisation.

---

[1] *Practitioner*, London, September 1903.

[2] Everard Home, *Phil. Trans.*, 1799.

Ectrodactylism is a term used to signify the absence of one or more fingers or toes; *polydactylism*, the presence of a greater number of fingers or toes than the normal. No animal has normally more than five digits on each limb, but a large number of species have less than five. Thus among reptiles, birds, and some mammifers, there are often only four, more rarely two or three. Ectrodactylism is common in the whole vertebrate kingdom. It occurs, as a rule, accompanied by the presence of malformation of other more important organs, such as the head. Thus we have seen that in acephalus and cyclocephalus monsters it is frequently met with. Indeed, it is rare, according to St. Hilaire, to see a diminution in the number of fingers in a non-monstrous individual.

When we turn to polydactylism, on the other hand, we find that it is consistent with normal bodily development, although many examples of it are associated with other abnormalities. Polydactylism is immensely greater in some classes or species than in others. Bateson records five cases in apes which he thinks suggest that this variation is something more than a mere result of high feeding or of unnatural conditions. I have been unable to find it specially mentioned as prevalent among primitive savages. Emin Pasha[2] remarks, "Polydactylism is rare; if the superfluous fingers are noticed at birth they are at once removed, otherwise they are left." A reference to it in the Bible,[3] where a man, who was a giant and was slain, had six fingers on each hand and six toes on each foot—twenty-four in all—testifies to its antiquity. The teratological records of Chaldea, which go back to the seventh century B.C., for the medical knowledge of which we are directly indebted to Dr. Ballantyne,[4] also contain numerous references to it. The inheritance of digital variation in certain families is very common. The forms that the variation may take may differ, but on the whole the variation, if transmitted at all, recurs more often than not in a like form. In the case mentioned by Bateson of three toes occurring in the ox, the descent was wholly through females, and the same is almost certainly true of polydactile cats. That anomalies in the number and variation of digits in man are hereditary is so abundantly known, that the difficulty is to limit the number of examples. A case is reported in the *Edinburgh Medical and Surgical Journal* for 1808, in which the transmission of the defect for ten generations had been effected by the females only of the family. In the famous case of Victoire Barré, quoted by St. Hilaire, there was only one finger on each arm, the other fingers and their metacarpal bones, with the exception of imperfect rudiments, being entirely wanting; on each foot there were but two toes, apparently the first and the fifth, but both very defective. She was twice married; by her first marriage she had a healthy and regularly formed male child, and by her second marriage two daughters malformed like herself. Her sister and father were also similarly deformed.

---

[1] *Journ. Acad. Nat. Sc.*, Pa.

[2] "Central Africa," p. 44.

[3] 2 Samuel, ch. xxi. vers. 20 and 21.

[4] "Teratologia," vol. i. p. 127.

Teeth.—Among the variations observed in the teeth of animals falls first to be mentioned complete absence of these organs. The naked so-called Egyptian or Turkish dog is extremely deficient in teeth, sometimes having none except one molar on each side, "which, though characteristic of the breed, must be considered a monstrosity."[1] In man several striking cases have been recorded of inherited baldness with inherited deficiency, either complete or partial, of the teeth.[2] Decay of the teeth is regarded as one of the signs of enervating civilisation. The skulls of savages show, as a rule, a marvellous state of preservation of the teeth. No doubt civilised man uses his teeth less than primitive man, for the one has his food almost masticated when it is set before him by an elaborate system of cooking, and the other had to use his in earnest to prepare his food for digestion. That, however, is a trivial consideration compared to the necessity that exists in the case of savage man to be provided with sound and serviceable teeth. That necessity compels the survival only of the fittest in this respect, and we are bound to attribute the better teeth of the savage to natural selection. Early caries of the teeth is almost universally present in idiots and imbeciles, which is one of those problems of correlated growth upon the meaning of which I confess I am unable to speculate.

I am informed by Dr. Guy of this city that the most common supernumerary anomalies are—(1) The appearance of the second mammalian incisor, which need not, however, be incisiform; it is often conoid, and is usually situated inside the arch; (2) the appearance of the fourth mammalian premolar usually outside the arch; (3) not uncommonly the appearance of the whole four mammalian premolars in regular or irregular form. The teeth most commonly suppressed are the lateral incisor and the third molar. Bateson[3] examined variations in the teeth of 3000 skulls of the higher mammals. He found that, setting aside minor variations, the animals showing the greatest frequency of extra teeth were the domestic dog, anthropoid apes, and seals. The hypothesis, now growing into an axiom, that wild animals as such are less variable than domesticated animals, is, he says, not born out by this research.

---

[1] Darwin, "Plants and Animals," vol. i. p. 35.

[2] Darwin, *loc. cit.*, vol. ii. p. 326.

[3] "Materials for the Study of Variation," p. 266.

Albinoism is common in plants, *e.g.* certain white flowers; in the lower animals, *e.g.* white mice, white rabbits, and in the human species it has no geographical or racial limit. It is found among the negroes of Central Africa,[1] among the North American Indians,[2] among the Laplanders and South Sea Islanders.[3] It is, according to Darwin and Prosper Lucas, "strongly inherited." Although it is probable that pigmentation is determined at a very early stage of embryonic life, it does not declare itself until a comparatively late stage of fœtal existence. In true albinos this development of pigmentation is permanently arrested. Other correlated organs and functions are also arrested. Thus we have it on the authority of Darwin that white cats with blue eyes are deaf. It has been observed that in certain cases the membrana pupillaris persists, and so does the fœtal down on the skin, and that malformations and physical and mental debility occasionally coexist. Dr. Felkin informs me that he met numerous cases of idiocy among albinos in Uganda. Emin Pasha states[4]—"The production of albinos by black parents is certainly not uncommon. Albinos are supposed to bring with them misfortune, and are therefore not considered to be of equal birth with their brothers and sisters." Féré,[5] in addition to the physical peculiarities mentioned, states that albinos often display facial irregularity, deformity of the ears, strabismus, and flat foot. According to Ireland,[6] albinoism coincides frequently with cretinism and alternates with idiocy in the same family.

THE GERMINAL ORIGIN OF MENTAL AND PHYSICAL DEFECTS.—*Twinning.*—In many species of higher animals, including man, plural births are abnormal. Especially so are identical twins and triplets, for while in the human race only one embryo is normally produced in one chorion, the development of more than one primary germ cell into an embryo is an anomaly. It has been estimated that in man identical twins form 25 per cent. of all twins. The appearance of twins in families is strongly hereditary, not only through the female but also through the male parent. "It has been supposed" (says Dr. William Sedgwick)[7] "that the hereditary production of twins was due to some peculiarity in the female rather than in the male sex . . . but . . . there are some cases which show that twins occasionally owe their descent as such to the male line." He quotes the following case from Virey on Generation (1817). Two brothers (twins) both had twins by their wives many times in succession; the wife of one of them having died, the second wife produced, like the first, twins. The next illustration he quotes from Stocks of Salford.[1] Of two twin brothers "one had a family of ten children—eight daughters and two sons—all of them twins; and the other a family of eleven children, of whom eight were twin born." It is not necessary to cite more examples of the hereditariness of twins through the male line, for the testimony is conclusive; the same form of heredity through the female line is not doubted. In turning now to the morbidity of plural births, I am indebted to the writings of Sir Arthur Mitchell. In an article[2] written upwards of forty years ago, he states, "From tolerably full information regarding 443 idiots we find that—(1) Eleven times the idiot was one of twins; (2) four times one or other parents of the idiot was twin or triplet born; (3) thirty-two of the 443 mothers had borne twins once, twice, or more frequently; (4) forty-three of the 443 families presented twins more or less frequently borne by mother, grandmother, aunt, or sister of the idiot." From the above statement it may be seen that Sir Arthur found plural births to be common in 20 per cent. of the families of 443 idiots. He concludes an interesting paper as follows:—"(1) Among imbeciles and idiots a much larger proportion is actually found to be twin born than among the general community. (2) Among the relatives of idiots and imbeciles twinning is also found to be very frequent. (3) In families where twinning is frequent, bodily deformities (of defect and of excess) likewise occur with frequency. (4) The whole history of twin births is exceptional, indicates imperfect development and feeble organisation in the product, and leads us to regard twinning in the human species as a departure from the physiological rule and therefore injurious to all concerned. (5) When we pass from twins to triplets and quadruplets, everything we know regarding these latter gives support to the general conclusion in question."

---

[1] Emin Pasha, "Central Africa"; Wilson and Felkin, "Uganda"; Livingstone, "Last Tour."

[2] Keating and Say, "Expedition Rocky Mountains."

[3] Pritchard, "Natural History of Man."

[4] "Central Africa," p. 94.

[5] "La famille Neuropath," p. 201.

[6] "Idiocy and Imbecility," p. 192.

[7] *British and Foreign Med. Chir. Rev.*, July 1863, p. 170.

"The whole doctrine of the tumours," says Beard,[3] "in one of his brilliant contributions to the study of morbid growths, centres in, so far as I can see, the problems of identical twins, triplets, etc., in fine, in the question of the number of embryos which may arise in one chorion." The proportion of males to females born in countries where statistics of birth are properly kept is roughly as 106 to 100. It occurred to Van Lenhossek to enumerate the sex and numbers of still-born fœtuses of which he had a large collection, and he calculated that the proportion of male births to females would have been, if these had lived to term, as 160 to 100. At this stage the subject was taken up by Dr. Beard, and from his enormous collection of aborted embryos down to the end of the second month, when sex can be distinguished, he calculated that had these embryos passed into the fœtal stage and been born alive the numbers of males to females would have been nearly as 200 is to 100. There is, therefore, probably an enormous loss of male embryos through abortion at an early stage of the ontogeny. When we take into account the greater mortality among male infants after birth, we are almost compelled to the conclusion that nature, in what seems to us her prodigal way, purposely determines the numerical equality of the sexes in the manner described. But this has only an indirect bearing upon my subject, which will, however, become more clear as I proceed. In the domestic pig, in which, by the way, monstrosities and idiocy are as common, probably, as in the human subject, there are only twelve to fourteen mammæ, but the uterus may contain from thirty to forty fertilised ova. It is manifestly impossible for the pig to suckle such a number; therefore some of them must be eliminated. Those embryos situated next the opening of the Fallopian tubes are generally selected for destruction, and it must be that they are absorbed, for abortion is impossible. An exactly similar process occurs in the cat and the rabbit. We do not know what this process of absorption is in itself, nor do we know why certain embryos are selected for absorption, but we may conjecture that they are the most unfit. But this process of absorption is found further back in development. "In every normal development" (says Beard)[1] "the chorion commences to degenerate at a well-defined epoch"—the critical period of the author. "Did it not do so its further unrestricted growth would lead to a form of cancer, deciduoma malignum or chorio-epithelioma. The degeneration of the chorion, and with this the arrest of its growth, are in all probability brought about by some substance within the fœtal allantoic placenta or contained in the blood of the fœtus." The critical period for the human embryo is at the end of the sixth week, when it ceases to be an embryo and becomes a fœtus, and the period is marked by the initiation of the formation of the allantoic placenta and the suppression of the yolk sac placenta. Should the embryo fail to exhibit itself in a normal manner at this period, the necessary procedure may be omitted and lead to its destruction or abortion. This is one great cause of the frequency of the abortion of monsters at the critical period. If, then, a monster is too deformed to form an allantoic placenta, it is aborted. We must therefore conclude that, but for the fact of abortion, the relative number of human monsters would be infinitely greater than it is. The previous remarks regarding the great preponderance of male abortions made me turn, I confess, for the first time to the statistics of idiocy, and I find that the available figures are few, with the exception of a valuable paper, in the *Edinburgh Medical Journal* for 1866, by Sir Arthur Mitchell, to whom I am again indebted, in which he shows that the proportion of males to females is 100 to 79. Sir Arthur makes the following suggestive statements:—(1) That the excess of male over female idiots and imbeciles taken together is considerable and steady. (2) That the excess of males is most marked in the graver forms of the disease. (This is highly suggestive in the light of what has just been said.) (3) That even among imbeciles, when we deal with large numbers, it will probably be always found that males exceed females, though not to a great extent.

---

[1] *Lancet*, London, July, 1861, p. 78.

[2] "Plural Births in connection with Idiocy," *Med. Times and Gaz.*, London, 1862, vol. ii. pp. 513–516.

[3] *Anat. Anz.*, Jena, 1903, Bd. xxiii.

---

[1] *Anat. Anz.*, Jena, 1903, Bd. xxiii.

From the writings of Beard, especially one paper,[1] I gather that there are two probable causes of abortion in early human embryos, namely, deficiency in the embryo leading to abnormalities in its germ cells and abnormalities in the germ cells, rendering the embryo useless. We now trace the cause of human anomaly very near its lair, and we are pretty safe in assuming that, however arising, it depends primarily or secondarily upon abnormalities in the germ cells, which it receives into itself at a certain stage, and we may conjecture that the male germ cells are more liable to abnormality than the female.

We cannot at present guess what the changes which lead to anomalous variation of the germ cells may be or what is the nature of the process; we only know three things certainly—(1) Anomalies are capable of being experimentally produced. (2) They are certainly innate in the germ plasm itself, otherwise they could not be regularly transmitted. (3) They occur in races probably with a numerical regularity, and generally limit themselves to certain families, in which they tend to be transmitted for long periods.

1. Let us briefly consider the two first points. When fertilised salmon ova are taken in the hand, and dropped from a considerable height on to the surface of the water, it has been demonstrated that 40 per cent. of the ova produce anomalous or monstrous variations. Geoffroy St. Hilaire recorded that both he and his father retarded development by shaking eggs in a direction corresponding to their long axis.

Richter obtained five malformations (three spina bifida with exencephalus and two exencephalus alone) out of seventy-eight eggs incubated at a low temperature. Exclusion of oxygen by varnishing the shell has also been followed by malformations.

The experiments of Fére are so well known that I need not dwell upon them. He injected into the egg various toxic substances, such as ether, alcohol, chloroform, chloral, morphia, etc. He succeeded in producing a variety of malformations in a certain proportion of instances. Geoffroy St. Hilaire records several undoubted instances in women, in which violent injury, directed towards the abdominal cavity at an early stage of pregnancy, caused the production of monsters. Perhaps the most curious and important facts of all the preceding experiments, apart from the production of malformations, are—(1) That they only occurred on an average in from 30 to 40 per cent. of the cases, the remaining being normal; and (2) that it was impossible to foretell beforehand, even in carefully conducted and uniform experiments, what the resulting anomaly would be.

---

[1] "Numerical Law of the Germ Cells," *Anat. Anz.*, Jena, 1902, Bd. xxiii.

2. But all the foregoing accidental or experimental instances of monstrosities refer to a retardation of growth and development of the embryo in the egg or in the uterus. They do not, therefore, explain the more subtle and more important influence of the germ cell in conveying the latent possibility of malformation. For it must be remembered that malformations consist not only of suppressed growth of parts, but also of additional growths. We may fancy in our own minds an explanation of the loss of fingers or the absence of a head by some theory of arrested development *in utero*, but we can scarcely argue from that to a similar explanation of an additional number of toes and fingers or of two heads. We may account by some theory for the causation of idiots or monsters by toxins circulating in the mother's blood, but we cannot legitimately extend that theory so as to explain the persistent transmission of similar phenomena through the male line in families or communities or in a race. Therefore, transmitted anomalies must be innate in the germ plasm.

TYPES OF RHEUMATOID ARTHRITIS, WITH SUGGESTIONS AS TO THYROID TREATMENT.

By R. Llewelyn Jones, M.B.(Lond.), *Late Medical Officer, Royal Mineral Water Hospital, Bath.*

The following cases of rheumatoid arthritis appear to me to be worthy of note. Many writers, from Spender onwards, have drawn attention to the prominent position which vasomotor phenomena occupy in the clinical picture afforded us by what we term rheumatoid arthritis. Some time since, in an article entitled "Rheumatoid Arthritis as a Cerebro-spinal Toxæmia," I endeavoured to show that such phenomena, occurring in rheumatoid arthritis, were clinically, at any rate, indistinguishable from those constituting what is known as Raynaud's disease. I based this assumption on the fact that in rheumatoid arthritis we find not only the ordinary syncopal and asphyxial seizures, as for instance in the extremities, but, moreover, that the rarer manifestations of Raynaud's disease are demonstrable, as for example transient obscurations of vision, attended by, and presumably dependent on, changes in the retinal circulation, which were to be observed ophthalmoscopically; and, furthermore, examination with the perimeter showed concentric contraction of the visual fields. Now, even, as in cases of Raynaud's disease, we find the vasomotor phenomena presenting infinite gradations in intensity and extent, so do we find the same capriciousness characterising their manifestation in rheumatoid arthritis. While, on the one hand, in the large majority of rheumatoid patients the phenomena of local syncope or asphyxia are slight, and by reason of their ephemeral nature readily overlooked; so, on the other, in a few cases, such as those appended, we find them widespread and intense, challenging comparison with the more severe forms of Raynaud's disease. It is obvious that it is only in the light afforded us by the more severe types of Raynaud's disease that we are enabled to grasp the full significance of the more trivial forms, and it is for this reason that I quote the following cases of rheumatoid arthritis, in some of which the vasomotor phenomena were phenomenally severe and widespread, and the fact that such intense phenomena may occur, invests, I think, the more common and less intense forms with a graver significance:—

CASE 1.—R., female, single, æt. 21. *Personal history.*—Four years ago she suffered with anæmia, also ulceration of the stomach with hæmatemesis. The next symptom noticed was that her big toe used to go "blue and white often," and then swelled. The same sequence was observed in opposite toe; afterwards both ankles swelled, also knees. Her hands went through the same changes. She at this time noticed that she "trembled" a great deal. About twelve months ago she noticed her collars getting "too tight," and she suffered with palpitation, and feelings of "heat," and causeless diarrhœa. For the relief of her joint condition she was sent to the Mineral Hospital, and presented, in addition to rheumatoid arthritis, the phenomena of Graves' disease. Her thyroid gland was enlarged, her pulse rate was 100, with slight tremor, proptosis, von Graefe's sign, and highly arched eyebrows.

CASE 2.—M., female, æt. 36, single. *Personal history.*—Had scarlet fever and measles in early childhood; had chorea when 14 years old; rheumatic fever at 21 years of age, and was then confined to bed over six months. Eight years afterwards she became anæmic; this was followed by severe indigestion, accompanied by vomiting, the latter at one time being so bad as to necessitate rectal feeding. During this period of gastric trouble she had several abscesses around her teeth, all of which, save two, were extracted. Ever since this illness she has suffered off and on with indigestion, vomiting, and diarrhœa. In addition she was troubled greatly with "cramps"; these were very painful, and affected her arms, legs, also muscles of neck. These muscular spasms, when they occurred in the legs, sometimes caused dorsiflexion of the ankle, at other times plantar flexion, preventing any attempt at walking. At other times the plantar muscles were affected, causing strained position of toes. Her hands during the paroxysms assumed a position of semi-flexion, and when the neck muscles were involved the head was rotated and flexed to one side. Coincidently she suffered with recurrent asphyxias of her extremities, especially hands. Last September twelvemonth her gastric symptoms—vomiting, diarrhœa—became very much aggravated, and, simultaneously, the muscular cramps and vasomotor phenomena. Her joints now gradually began to swell, fingers, left elbow, ankles, and shoulders, and for treatment of which she was sent to Bath. On admission she was seen to be suffering from rheumatoid arthritis, with the typical fusiform enlargement of the finger-joints, much muscular wasting, also fine tremor of limbs. Her deep reflexes were very brisk, both in upper and lower limbs, and Chvostek's symptom was easily educible over both ulnar nerve-trunks. During her stay in hospital she suffered from vomiting and diarrhœa, and her joints became worse coincidently, and amelioration of the gastric symptoms was followed by a diminution in her joint troubles. Heart and lungs were apparently normal. Pulse rate was 80 per minute.

Case 3.—S. C., female, æt. 35. When a child she suffered from measles, whooping-cough, scarlet fever. When 11 years of age she had an attack of "rheumatism." When 21 years of age she had an attack of "rheumatic fever." Two years afterwards she contracted influenza, complicated by left-sided otorrhœa. She was deaf for two months, but got perfectly well eventually. She married when 27 years of age, was confined in the following year; the confinement was a difficult one, attended with severe flooding. Ever since she has suffered from right-sided pelvic pain and leucorrhœa, and she had, at the time of my examination, definite prolapsus uteri. When about 32 years of age she began to get very "nervous," crying causelessly, etc., and gradually assumed a more or less semi-invalid attitude. Six months ago, her dressmaker told her she had a "funny" throat, *i.e.* swollen. The swelling used to fluctuate in size, enlarging at menstrual periods. About this time she began to suffer with "trembling" and palpitation of heart, and her eyes became "staring." Last spring, she began to suffer occasionally with pain in the small of the back. These attacks of lumbar pain used to come on especially in the daytime.. They were attended by a feeling of "chilliness" and a constant desire to make water, which would be quite red, "brick-red," and in a few hours would become quite clear again. About the same period her fingers used to turn "blue and white," likewise her feet. These seizures were followed by peeling of the skin of hands and feet. Shortly afterwards her right knee-joint became swollen, then the ankle, and afterwards the same joints in the opposite limb were affected. In the upper limbs the wrists and elbows, and some of the phalangeal joints were affected. In the summer of the same year she was sent to Bath for treatment of the joint condition, and she then presented, in addition to the phenomena of rheumatoid arthritis, those pertaining to the complete type of Graves' disease, marked proptosis, von Graefe's sign, also Stellwag's enlarged thyroid, tremor, and a pulse rate of 112 per minute. Her knee-joints were improving, but still puffy; the joints of the left leg were much the worst, and the glubeal muscles on this side showed marked wasting. Her knee-jerks were normal. The joints of fingers, especially those of forefinger and thumbs, were undergoing an acute exacerbation; her elbows were painful, she suffered much pain along the preaxial border of the forearm, which was attended by cramp, resulting in flexion of elbow and pronation of forearm, and during which the fingers went white. Her arm-jerks were brisk, and tapping of her ulnar nerves evoked a contraction of the muscles supplied. The skin over fingers was thin, irritable, apparently having undergone atrophic change. During her stay in Bath she had one of the paroxysmal attacks of pain in the lumbar region, attended by the same chilliness and "red" water. On examination it was of a sherry-brown colour, and on microscopical examination showed the presence of a few red blood corpuscles in the sediment. The supernatant fluid showed the band of oxyhæmoglobin.

CASE 4.—D. B., male, æt. 37. *Personal history.*—Had apparently been a healthy man until seven years ago, when he contracted gonorrhœa. Six or seven weeks afterwards, his joints began to swell, and within six weeks from onset the following were involved:—Both knee joints, sterno-clavicular joints, elbows, wrists and fingers, shoulders. Four years ago he had an attack of pneumonia. The vasomotor phenomena about to be described began with onset of joint troubles, and have persisted ever since, and any remission or exacerbation in their severity was attended by a similar change in the joint troubles. Eventually he was sent to Bath for treatment of the joint condition, and he then presented the clinical picture of rheumatoid arthritis.

The syncopal and asphyxial seizures first appeared in the ring and middle fingers of each hand. The joints of these fingers became the seat of periarticular swellings, which swellings, as is common in the earlier stages of rheumatoid arthritis, rose and subsided from time to time; but any increase in this size was heralded by increasing severity and frequency of the asphyxial phenomena, which, during the worst periods, occurred several times an hour. While the finger-joints alone were affected, the vasomotor phenomena did not invade the forearm; but when the wrists became implicated, they extended chiefly on the dorsum of the forearm. At the same time his feet became the seat of the same phenomena, with swelling of joints of both big and little toes. The vasomotor phenomena extended up the legs, mostly on the outer side, almost as far as the knees. Later on the vasomotor phenomena invaded the face. They began first in the right zygomatic area, subsequently including the ear, and afterwards the same area on left side of face became involved. The conjunctivæ participated in the circulatory disturbances, became reddened, with intolerable tingling and fogginess of vision. Vision is good in between the attacks save for some degree of photophobia. These "fogs," as he termed them, used to come and go several times. During these attacks, if reading, the letters ran into each other, and sometimes they became quite a blank. This patient also suffered from curious attacks of vertigo. They usually followed a condition of local asphyxia in the ears. The attacks usually begin on the right side of the face. While the ear was going through the stages of syncope and asphyxia, he experienced a "roaring noise." Giddiness supervened, with staggering and reeling—objects appear to be turning round. Patient has sometimes fallen, but usually manages to steady himself by clinging to neighbouring objects. Occasionally he has lost consciousness during the more severe attacks. He tended to fall towards the side of the affected ear. Hearing is normal between attacks. It might well be thought that here his vasomotor phenomena terminated; but, in addition, he experienced similar troubles in the genital sphere. These attacks usually began with a feeling of "burning" in the body of penis, which seems swollen. Acute pain follows in perineum and penis, with retraction of testicles and shrinkage of penis. The pain is so intense as to preclude sitting down. The penis becomes mottled white in colour, feels cold, with sensation of numbness—"pins and needles." At this stage retraction is marked. The asphyxial stage succeeds. This last is followed by a stage of engorgement and semi-erection. The scrotum passes through the same stages, with accompanying retraction and subsequent pendulous condition. The skin of buttocks was also involved. Sweating over the whole area involved signalised the ending of an attack. These penile attacks were sometimes induced by mere contact with his hands, when in the algide stage, and came on when preparing to micturate. Signs were not wanting of an extension of the phenomena to the mucous membranes, inasmuch as they were accompanied by the following symptoms:—An involvement of buttock and anus was accompanied by great tenesmus, and afterwards by diarrhœa, the stools having the appearance of frog's spawn. On the other hand, when in the penile region, there was, during the attack, a futile but intense desire to urinate. Afterwards he passed urine, which he described as like "old brown brandy." Unfortunately these attacks usually came in the daytime, and, though repeatedly asked to keep the urine passed directly afterwards, I was never able to procure it. The skin over buttocks used to peel off after attacks. Shivering to the extent of shuddering preceded these attacks. There is another point of interest in the case, *i.e.* the condition of skin over outer side of legs, *i.e.* from ankle to knee. It was of dead-white colour, firmly bound down to subjacent tissues, quite devoid of hairs, very cold to touch, never sweating, and presented a marked contrast in all these particulars to skin over adjacent areas. Sensation, when electrically tested, was gone over this area.

Case 5.—Some time since a case of spondylitis deformans presented the same widespread vasomotor phenomena, affecting face, extremities, and genital organs. In this case, the Raynaud phenomena, in both upper and lower limbs, preceded by a considerable period the development of joint swellings. The right side of spinal column, and also the right leg and arm, were those chiefly affected, and the Raynaud phenomena were much more marked on that side. I have elsewhere noted this sequence in individual fingers, *i.e.* the Raynaud phenomena were confined to fingers, which became afterwards the seat of periarticular swellings. The right buttock shows marked wasting. I have elsewhere drawn attention to this unilateral wasting. It does not seem to be dependent on correlated disease of the hip-joint, but may occur in cases where the disease is confined to the ankle-joint of the same side. I endeavoured to explain it by the fact that, according to Head, the glutei are innervated by the first and second sacral segments, which also supply the peronei, anterior tibial muscles, and intrinsic muscles of the feet.

Case 6.—O. M., æt. 40, married sixteen years. *Personal history.*—

Five years ago, fourteen months after the birth of one of her children, she contracted influenza, *i.e.* in March of that year. In the May following, she was one morning engaged in domestic work—"ironing," when suddenly the arm became the seat of acute pain, the "iron" dropped out of her grasp, and the limb was for some time powerless. The pain was extremely excruciating, running along the inner side of wrist and forearm, as far as shoulder, into each, and very soon was accompanied by pain radiating into scalp. Following swiftly upon the pain along the inner side of forearm, the wrist-joint swelled. She suffered at this time intercurrently with severe metrorrhagia. The joints next implicated were the metacarpo-phalangeal joints of index finger and thumb. Simultaneously puffiness over the superior radio-ulnar articulation occurred. During this period she suffered greatly from pain radiating along the preaxial border of forearm, with spasmodic flexion of elbow and pronation of forearm. At this time noticed that, when ringing the telephone, she has had to call for some one to unloose her grasp, which she was quite unable to do herself. Intercurrently, she suffered often with oft-recurring blueness of fingers, and palmar sweating. A few months since, while on a visit to a neighbouring town, a thunderstorm intervened, and she witnessed the spectacle of a house struck by lightning. She received a severe fright, was conveyed home by rail, and, on reaching her destination, had to be carried from the carriage. Within twenty-four hours she experienced a feeling of numbness in her left thigh, which was followed by intense pain along the course of the sciatic nerve; great swelling of knee followed, and great pain in hip of same side; the whole limb became much enlarged, and the seat of diffuse elastic swelling. She came to Bath this summer, with the diagnosis of rheumatoid arthritis. On examination she was found to be a woman of short stature, extremely stout. Her facial aspect rather suggested comparison with myxœdema, presenting some slight thickening of skin and subcutaneous tissues, with a marked malar flush. Her hair was sparse and grey, and she informed me it was coming out in handfuls, though formerly it reached to her waist. Mentally, she was emotional, irritable, and very often, as she expressed it, she "didn't know whether to laugh or cry." The skin of her body generally, excepting the palms of her hands, "was dry and harsh and tense," and could not be pinched up, except in large folds. As regards her joints: The finger-joints were puffy; one of them she was unable to flex voluntarily. She suffered with cramps in them. The main joint trouble was centred in the left lower extremity. The knee was extremely puffy, grating most unpleasantly when moved, likewise the hip of same side.

SUMMARY.—In reviewing and comparing the first two cases in this series, one notes that in both these were present as prodromal symptoms—muscular cramps and vasomotor phenomena. These symptoms were present before the appearance of periarticular swellings. While, on the one hand, in the first case the muscular cramps were the more prominent symptom, in the second case the vasomotor phenomena were more marked, and the muscular cramps less obvious. Have we not here a resemblance to tetany on the one hand, and Raynaud's disease on the other? Now if we take a paroxysm of tetany, with its attendant vasomotor phenomena, and compare it with a paroxysm of Raynaud's disease, with its associated muscular cramps, the question presents itself: Is there so much difference clinically? Does not the distinction lie mainly in the varying prominence of certain symptoms, and those symptoms common to both? Thus in tetany the principal muscular cramps dominate and colour the clinical picture, pushing the attendant, though less obtrusive, vasomotor phenomena into the background, while in Raynaud's disease the vasomotor phenomena stand out in bold relief, and in their turn the muscular cramps lapse into comparative obscurity. May we not see in these superficial differences an indication of a profound resemblance in the two diseases? Are they not both probably dependent on some underlying cerebro-spinal toxæmia? Such has been acknowledged to be the case in tetany, and signs are not wanting that such may be the case in, at any rate, some cases of Raynaud's disease. Note its incidence suddenly after intestinal obstruction, likewise the occurrence of dead and white fingers in pernicious anæmia. Again, note the tendency of these two diseases to develop along the same lines. Periarticular swellings certainly occur occasionally in tetany, and joint troubles have been recorded in cases of Raynaud's disease; and if the vasomotor phenomena occurring in rheumatoid arthritis are clinically indistinguishable from true Raynaud's disease, then it follows that joint troubles are associated with Raynaud's disease. Thus in the three diseases, Raynaud's disease, tetany, and early rheumatoid arthritis, we find three groups of symptoms common to all, namely, vasomotor phenomena, muscular cramps, and periarticular swellings, and the differentiation of them clinically depends upon the prominence of one or other of them. Consideration of the foregoing points of similarity in these three diseases has led me to question whether they may not, under some conditions, graduate insensibly into each other as members of one family group, owning one common parent origin—a cerebro-spinal toxæmia. During this, so to speak, incubation stage, *i.e.* prior to the formation of periarticular swelling, it is, I think, impossible to differentiate between these vasomotor phenomena and those of the type Raynaud described; and in other cases, where the muscular cramps are more prominent, it is difficult to exclude tetany, all the more so when there is present an intercurrent malady, *e.g.*, gastric ulcer, which is known to be etiologically related to tetany. Furthermore, inasmuch as an increase in severity and frequency of these associated phenomena occurs just before the appearance of periarticular swellings, it seems to suggest that these latter are simply further elaborations. It has been granted that these swellings in tetany are dependent on "trophic and vasomotor disturbances of innervation," and it seems to me that such may account for the spindle joints of rheumatoid arthritis. Passing on to the third case, we find here, as in the first case, in addition to the phenomena of rheumatoid arthritis, the symptoms pertaining to the complete type of Graves' disease. I reported, some time since, fourteen examples of these two diseases existing in fusion, so to speak. Incomplete or larval forms are not so uncommon, and the increased pulse rate of certain cases may probably be a larval manifestation. Other points of interest in the case are the vasomotor phenomena and what was apparently hæmoglobinuria. It is fairly well agreed that there is some intimate relationship between Raynaud's disease and hæmoglobinuria. The third and fourth cases I have reported simply because of the widespread nature of the vasomotor disturbances. I regret that in neither of the two males was I able to obtain the urine after a paroxysm. In the interparoxysmal periods, it presented no abnormal characteristics. The last of the series is worthy of report, because it represents a type of rheumatoid arthritis which apparently presents some features met with in myxœdema. These cases are remarkable for widespread elastic-like swelling of a most obstinate nature, which resists medication, massage, etc. Some time since, *i.e.* last January, I suggested the use of thyroid extract in rheumatoid arthritis. I based it on the facts that I had under my care a case of Graves' disease in whom, after recession of the thyroid swelling, periarticular swellings supervened, and also because from time to time one meets with cases having the characteristics above referred to. When one remembers that occasionally myxœdema supervenes upon Graves' disease, it seemed worthy of a trial, as after all it is difficult to exclude the possibility of such cases having passed previously through a larval form of Graves' disease. Be the explanation what it may, the administration of the thyroid was attended by an encouraging amount of success. The swelling rapidly diminished, likewise her pains; her palmar sweating and vasomotor phenomena were much improved, likewise her subjective feelings of coldness. Certain of her finger-joints, where the disease was in an earlier stage, recovered mobility. Her knee and hip joints, where undoubtedly destruction of the cartilage had already taken place, remained *in statu quo.* It is, of course, too early to decide whether such improvement is merely temporary, but I certainly think the drug deserves a trial, at any rate, where other means have failed, and in my experience they often do.

The richness of the thyroid gland in iodine may possibly account for the well-known efficacy of iodine preparations in cases of rheumatoid arthritis.

Reverting briefly to the pathology of some of the more chronic toxæmias, in the article entitled "Toxic Scleroses of the Spinal Cord" in Gibson's "System of Medicine," we note that Williamson has in some cases of diabetes found sclerosis of the posterior columns. In ergotism, a disease closely related to tetany, the same lesion has been noted. In pellagra, dorso-lateral sclerosis occurs. Lichtheim has noted the occurrence of cord changes in pernicious anæmia and analogous conditions; and Triboulet and Thomas have reported a case of rheumatoid arthritis in which sclerosis of the posterior columns was present.

The fact that definite cord changes have been so seldom found in rheumatoid arthritis, can scarcely be adduced as a strong argument in favour of its not having a central origin. Does it not conform in this respect to other known spinal toxæmias, such as tetany? In the majority of cases of tetany no changes in the cord have been found, and we have to draw largely upon the evidence afforded us by ergotism for our views as to its pathology.

Again, how scanty is the pathological evidence at our disposal in cases of Raynaud's disease, and yet the central theory of its origin still holds its own. Now, tetany and Raynaud's disease are definitely periodic, and so are the early phenomena of rheumatoid arthritis, including the periarticular swellings which rise and subside from time to time, and it does not seem reasonable that we should expect periodic diseases to be correlated with fixed organic changes, not, at any rate, until the disease has existed for a prolonged period, a period sufficient to initiate degenerative nerve changes (as a result of prolonged toxæmia).

Bearing in mind the fact that rheumatoid arthritis is a disease running a definite though variable course, I cannot help thinking that the more severe types of the disease, in their terminal stages, possibly owe many of their gloomy characteristics to these secondarily induced degenerative changes in the spinal cord.

In a previous article, published in this Journal, I drew attention to the presence of anæsthesia over the outer side of the legs (between knee and ankle) in some long-standing cases of rheumatoid arthritis. Some time afterwards I read in the *Practitioner* an exhaustive article on "Tabes Dorsalis," by Dr. Dormer Harris, who draws attention to the fact that this same area is one of the earliest to show sensory perversions in tabes. Such an area of anæsthesia was present in one of the cases just described.

The association with Graves' disease is also of interest when we recollect the affinity it evinces for diseases of the central nervous system, *i.e.* chorea-insanity; and Charcot relates instances of its occurrence in a few cases of tabes.

It is to be hoped that more evidence as to the pathology of rheumatoid arthritis may soon be forthcoming, for, as Professor Osler says, "we need information as to the condition of the spinal cord in these cases of arthritis deformans."

CAPE COLONY AS A HEALTH RESORT FOR THOSE SUFFERING FROM PULMONARY PHTHISIS, WITH SPECIAL REFERENCE TO THE GRADED ALTITUDE SYSTEM.

By JOHN ALEXANDER ROBERTSON, M.B., C.M., *Matjesfontein, Cape Colony.*

GENERAL CONSIDERATIONS.—One has heard much, and read much, about the South African climate, with regard to the treatment of pulmonary phthisis; but there has always been a certain element of vagueness associated with the subject. It was a very common thing at home, before the open-air treatment systems were so much in vogue, for patients suffering from "chest complaint" to be told they should go to South Africa. The patient would say, "Where?"—for South Africa is a big order—and the doctor, very often an eminent specialist, would probably say, "Oh, I am not very particular, so long as you go to South Africa. Harrismith has a reputation; suppose you go there." Now, nothing could be more irrational or unsatisfactory than this, for it matters a great deal, in certain stages, what altitude is selected, especially when the case is more or less on its trial. General rules may, however, be laid down, with special bearing on the various classes of cases, which will be discussed later on.

Generally speaking, and in all cases, a good rule is for the patient, when he arrives in Cape Town, to consult a good local doctor of experience, who will decide how long he, the patient, should remain at the coast recuperating after the voyage, and getting his "land-legs," before proceeding to the higher and drier altitudes of further inland.

As I have indicated, I shall discuss the various classes of cases later on, and in the meantime devote my attention to the consideration of—

THE SUITABILITY OF THE COUNTRY AND ITS CLIMATE FOR USE AS A HEALTH RESORT IN CASES OF PULMONARY PHTHISIS.—The formation of the country seems to be peculiarly favourable for the development of what I shall call the "graded altitude system of treatment." From the coast one ascends gradually to a series of plateaux, the first being at an altitude of about 800 ft., and the next about 1500 ft.; and then we come to the Great Karroo, varying from 2000 to 5000 ft.

The 800 to 1500 ft. altitudes have considerable vegetation, especially in the winter months, when they are very damp. The Great Karroo is very dry. There are no trees to speak of, and very few rivers that are constantly running. The general surface of the country is covered with a low scrub, known as the Karroo Bush. It may be mentioned that "karroo" is a Hottentot word meaning "barren," and is a guarantee of fresh air and open country; and certainly there, one does get a sufficiency of both. Vast undulating plains bounded by ranges of fine mountains, and beyond these mountains more plains, and then more mountains; and so on, for what seems to be an almost interminable extent.

From November to March the climate of Cape Town and the coast generally is fairly suitable for pulmonary invalids. There is very little rain during that period, and the heat, although somewhat oppressive, is never unbearable. This, too, is the best time of year to be at the intermediate altitude of 1500 ft. (*vide* "Rainfall Table"). Here the air is crisper and much more invigorating than at the coast, and there is just that amount of rarity sufficient to give expansion enough to the lungs, to be an education and preparation for the higher altitudes. During this period in the Karroo the weather is hot, but never oppressively so, and as a rule the nights are fairly cool. In March the weather gets cooler at, say, 3000 ft., and in April it is lovely—clear, warm days, and cool, refreshing nights.

From the Hex River Mountains, as far as Laingsburg, the rains fall chiefly from May to August. They are, indeed, the Peninsula Rains, considerably modified. The shade temperature varies from 32° F. in the night to 60° F. in the day. The cold is felt to be piercing, but it is a "healthy cold," and rarely do any bad effects accrue from it, so long as a person is suitably clad.

From Laingsburg upwards it rains in the summer months, during the "thunder weather." During this period, in this the Karroo proper, there are some very hot days; but, generally speaking, they are tolerable, except perhaps just immediately before a thunder-storm, when they are very oppressive. It is a remarkable fact that people newly out from home stand the heat better than those who have been some time in the country. In that part where you get the winter rains, *i.e.* from Hex River Mountains to Laingsburg, the wet weather seems to be worse than it really is, on account of its rare occurrence. This season is looked upon by Cape authorities as the best for being on the. Karroo. Then you will find the inhabitants of Cape Town and the coast towns going up there to escape the "muggy" weather. As a rule the Karroo winter days are lovely, clear, and invigorating—the so-called champagne atmosphere—with a warm sun. The nights are cold, and suitable for sleeping. There is never the great coldness in the shade that is experienced in Switzerland. From Laingsburg upwards the weather in winter is milder than it is in the first part of the Karroo.

So much for the country and its climate, which latter is doubtless the chief factor in the treatment of pulmonary complaints; but there are other factors which are also very important, namely, (1) Food and surroundings. (2) The disposition of the patient. (3) Question of ways and means.

1. Food and Surroundings.—Until lately there is no doubt that for love or money it was very difficult for the invalid to get suitable food, and the surroundings, so far as hotel and boarding-house accommodation were concerned, were also far from satisfactory.

Mutton in various forms—roasted, stewed, chops, rissoles, etc. —was the staple dish. Eggs and milk were difficult to get, and vegetables were scarce. Cooking, as a rule, bad and "greasy," and liquors were inferior.

Nowadays, however, those who are in the catering line have become alive to the fact that, if they are to be successful in getting and keeping good customers, they must advance with the times. The consequence is, that there are now many good and comfortable hotels. Especially might be mentioned those of Messrs. James D. Logan & Co., Ltd., at Cape Town (sea level), Ceres (1500 ft.), Worcester (800 ft.), Towns River (2400 ft.), Matjesfontein (3000 ft.), and Beaufort West (2700 ft.). One thing that must not be forgotten is the De Beers Sanatorium at Kimberley (4042 ft.), which cost £20,000, and was built with all the most modern improvements, at the instigation of the Right Honourable C. J. Rhodes, who, in a letter to Dr. Scholtz of Cape Town, said—

"Groote Schuur,
"*January* 6, 1897.

"Dear Dr. Scholtz,—I thoroughly endorse all your remarks as to South Africa being a health resort; I myself, as you are aware, have seen so many wonderful recoveries upon the plateau.

"And, moreover, from my great faith in this climate, I have induced the De Beers Company to spend about £20,000 in erecting a sanatorium near Kimberley, which is now approaching completion, and I feel sure this resort will be the means of saving many a life.

"I honestly believe that, owing to the purity and dryness of our climate, the growth of the tubercle is frequently checked, and after a period becomes entirely arrested.

"Our plateau has the advantage over St. Moritz, and other places on the Continent, of having a dry warm climate, free from mist and cloud; and, in addition, you are not exposed to the chills which naturally occur in the shade at similar altitudes in Europe.—Yours very sincerely,

(Signed) "C. J. Rhodes."

At all of these places just mentioned good sanitation is assured. There are good baths, an excellent cuisine, and the management is fully alive to the necessity of a good supply of eggs, fish, fowl, etc., for invalids, and the catering is carried out accordingly. It must, however, be remembered that these things have to be paid for, and hence the great importance of the question of ways and means.

If people care to leave the beaten track, there are various farms they may arrange to go to and live cheaply at; but there is always the difficulty about feeding and sanitary arrangements.

2. THE DISPOSITION OF THE PATIENT.—This is a very important factor in bringing about a satisfactory result, or otherwise. There can be no doubt that those patients endowed with strong will power and a cheerful disposition do much better than those who are despondent, and, so to speak, "lose the day." The old saying that "faint heart ne'er won fair lady," applies very emphatically in the fight against this malady, *i.e.* pulmonary phthisis. This is, of course, more appreciable when the patient has left home and come to a country where he will be deprived of the society of his intimates, often of the society of his nearest and dearest, and where, until lately at least, home comforts, in the true sense of the word, were unobtainable. Then the "faint heart" is inclined to give in, and say, "What is the good of fighting any more? I cannot stand this any longer. I would rather go home at all risks." This is frequently done, and with disastrous results.

The patient with the strong will and stout heart, on the other hand, says, "It is always darkest before the dawn," and "There is a silver lining to every cloud." He settles down to make the best of matters, gets accustomed to his surroundings, which gradually get a sort of fascination for him, and the feeling of "home-sickness" wears off. He begins to take an interest in colonial affairs. Perhaps he is lucky enough to get suitable and congenial occupation. His state of health has been gradually improving, and although he may be anything but robust, he feels he can take an interest in life, and has a right to live. He may indeed become the most important and valuable life in the whole community.

The foregoing applies chiefly to the most important class of invalid, that discussed later on under head No. 3.

3. MEANS AND EMPLOYMENT.—The question of means is a most important one—more important, perhaps, than would at first appear to be the case. It is necessary that every invalid coming out to South Africa should have a certain amount of money. If he is robust, and only "threatened" with pulmonary mischief, perhaps he may risk coming with a limited amount; but if the disease has got a fairly firm hold, it is absolutely necessary that he should have enough to keep him for a year at least. If he hasn't, the chances are that he will accept employment too soon, or employment that is unsuitable, and do himself harm in that way. Or he may feel that he cannot work, and then the awful worry comes—the worry that kills. He has to be dependent on others, and he has to live, and maybe die, existing on charity. Whereas, had he had means, he would have been rid of that great element of worry, would have been able to get the best of everything, and, above all, would have had that blissful

feeling of independence. Then he has no necessity to work, except as a recreation, and to keep his mind occupied.

How different, under the circumstances, are the chances and lot of the man who has means and of the man who hasn't! As I have already said, I do think it well for any one who is to be in the country for any length of time, to have some form of employment; but that employment must be light, congenial, and suitable in every way.

After a man has been a year or so in the colony, he has given it a fair trial, and can usually tell whether or not it will be safe for him to carry on his profession or trade, or accept some employment that may be of a more suitable nature—if he is lucky enough to be in the way of getting such.

With regard to females, it is more difficult for them to get suitable employment. They may get situations as governesses on up-country farm schools, etc., but they must not on any account be allowed to lead indoor sedentary lives. With them, even more so than with males, it is necessary that they should have means at their disposal.

PRECAUTIONARY MEASURES.—Patients should always be instructed in the ordinary precautions that must be observed with a view to prophylaxis in their own case, and to the prevention of the spreading of the disease to others. Pocket-spittoons containing an antiseptic, such as corrosive sublimate (1–1000), should be used, or, failing these, antiseptic rags that can be burned. All handkerchiefs should be disinfected before being washed. Promiscuous spitting must be studiously avoided. The patient must lead a cleanly, hygienic life. Proprietors of hotels, and others who have to deal with patients on their premises, should see that rooms are properly disinfected, and that closets are kept clean, and, especially where the night-soil system is in vogue, see that disinfectants, both powdered and fluid, are freely used. Scrupulous cleanliness all through the premises ought to be rigorously enforced.

CLASSES OF PATIENTS.—It seems to me that patients may be divided into four classes:—

1. *Those who have merely a tendency to be "weak-chested."*—To those individuals, coming to the Cape is more or less of the nature of a pleasure trip. They must, of course, exercise common-sense precautions—going quietly from place to place, and gradually approaching from the coast the higher altitudes of further north and further inland. This class of invalid (if invalid he can be called) has invariably means, or else he wouldn't have left home under the circumstances. Therefore he can command the best of everything in the way of hotels, luxurious travelling, and so forth.

I may here mention, parenthetically, that railway travelling at the Cape is very comfortable, even by the ordinary mail trains.

Refreshments are provided at various stations along the line. A system of dining-cars attached to the trains is being introduced, and will soon be general.

2. *Patients who have very incipient chest mischief, and who are able to get about well, and take a fair amount of exercise, but for whom it has been deemed advisable that they should come to a high altitude and dry climate, for the purpose of aborting an insidious disease.*—One of this class may be looked upon as a robust invalid. Well, for him it is not so particular how he proceeds about going up country, so long as he goes soon and takes ordinary precautions. Provided he has means, he will have a comparatively easy and pleasant time of it. But the question may arise, What is he to do if his means are scanty? Then he must sink pride and apply for a clerkship or some light job, in an up-country store, go on a farm and teach children for a small salary and board, or help in outdoor work on a farm—in fact, turn his hand to anything in the way of employment that is light, and gives him the opportunity of having plenty of fresh air. Being a robust invalid, the chances are that he will get something suitable.

He should be as much out of doors as possible, in any case, take gentle exercise, or do light work, always stopping short of anything approaching fatigue. He should have plain, nourishing diet, including plenty of milk; pay attention to the state of his bowels, and take a laxative when necessary. No special medicine is required; but, in winter especially, cod-liver oil and malt will be found to be beneficial.

3. *Those patients on whom the disease has got a pretty firm grip, who have considerable catarrh, expectoration, and slight rise of temperature in the afternoon, breathlessness, but no, or only very slight, night sweats, and little hectic.*—These are the cases which call for the most judicious handling. As a rule, after a long sea voyage, and the necessary bustle and excitement of getting ashore, the patient is fatigued and flat. He requires rest and suitable food and stimulation; so he should go to a quiet, comfortable hotel (*i.e.* if he has no friends with whom he can stay), and remain there quietly for twenty-four hours or so. Then he should see a good local medical man, so that he may get the necessary advice. The chances are that, in a case of this nature, the doctor will recommend the patient to stay for a week or two in Cape Town, in order to get rested, and then go up country—not too far at first, to an altitude of, say, 1500 ft. There the air will not be too much rarefied, the expansion of the lungs will not be too great, and the heart will not be too much taxed. In order to carry this out properly, the patient should arrive in Cape Town about the beginning of November, and get to this 1500 ft. altitude in December. He may remain at this till the end of February or the beginning of March, and then he had better be thinking of trying a higher altitude—provided he has found the moderate height at

which he has been for the past few months has had no bad effects. He may now safely go to the Karroo—that great barren sanatorium of South Africa. Here he can get an altitude varying from 2000 to 5000 ft. He will probably select a place at between 2000 and 3000 ft.

I would now like to give the patient a few hints for his guidance on arriving at a "health resort." He should make it a rule that he doesn't discuss his condition with others, or allow others to discuss their condition with him. There are some people who take a morbid pleasure in this sort of thing, and they should be discouraged in every way. The patient should never take his own temperature. He must take a moderate amount of exercise, always stopping short of fatigue. He can sit and stroll in the open air. He should have plenty of literature of a light nature—weekly illustrated papers are much appreciated. He must, in fact, "take himself out of himself" as far as possible.

If there happens to be a doctor in the place, it is a good plan for the patient to report himself and give an account of his illness. This will help the doctor to give advice with regard to baths, amount of exercise, etc. He should sleep in flannel pyjamas and wear a cholera belt, and if he perspires at all freely, he should change these things frequently. He should sleep in an airy room with plenty of ventilation, without having a draught over his bed. In warm weather he can rise fairly early—say 6.30 A.M.—and have a tepid sponge. This is a good time to have a glass of milk with a little whisky or brandy in it. He should not take exercise, to any extent at least, before breakfast time.

His diet should be plain, nourishing, and stimulating—avoiding made-up and fancy dishes, especially if, as there is likely to be, a tendency to dyspepsia. The moderate and judicious use of alcohol will often be found to be beneficial. As a rule, whisky and water will be found to be the most suitable form in which to give alcohol; but good Hermitage (colonial claret), beer, and stout are often found to agree well with this class of patient. Port and sherry will usually be found to be too heavy, and to upset the stomach, and this result should in all cases be avoided, if possible. Champagne is much too acid to be taken in any quantity, although it and brandy must always be remembered and regarded as the most valuable of emergency pick-me-ups.

Should this altitude be found to suit, and the patient improve —gain weight, temperature keep more normal, and sweating stop —he may stay on for a considerable time. After nine months or so, he will probably derive great benefit from a trip to the coast. He mustn't remain there for longer than a fortnight, and he ought, if possible, to go about the beginning or end of the year. He will be surprised to find how much energy he has in the so-called enervating atmosphere of Cape Town. He feels lighter and better, and it is wonderful how he eschews the help of cabs and cars. When in Cape Town, he might take the opportunity of seeing the doctor whom he consulted on landing, who can further advise him. Generally speaking, however, after a fortnight or so, he had better be getting up-country again. If he can get some light and congenial work, good and well. He may stay on the Karroo for a while, or he can now go further up—say to Kimberley, or even to the Orange River Colony.

4. *Those cases which are far advanced in disease.*—When a case has gone so far that the patient cannot get about fairly well, when night sweats are severe and persistent, when expectoration is profuse, when the temperature is high with evening exacerbations, and when there is extreme emaciation—then, I say most emphatically, such a case should not be sent to the Cape—not even if the circumstances will permit of a nurse. These cases never do any good. They miss the kindness and attention and careful dieting of home life, and eventually they die amongst, and in a land of, strangers. So that, for *their own sakes,* it is most desirable that they should be kept at home. It is also advisable, for *the sake of others,* that they should be kept at home. They cannot get better themselves, and they exercise a most depressing effect on those who are not in an advanced stage, and so retard their progress towards a good result. Of course, it is difficult to know where to draw the line between what is to all intents and purposes a hopeless case, and a case which appears to be very bad and which may eventually recover, to a certain extent at least. Still, when a patient has all the bad symptoms I have mentioned at the beginning of this paragraph, and these remain persistently, after the best surroundings that are to be got in the British Isles have been tried—then I say the patient should on no account be sent out here. Any one in South Africa who has had experience of such cases always thinks, "Why couldn't he have been kept at home, where he might at least have died amongst friends and surrounded by home comforts?" This is a very doleful picture; but, unfortunately, it is a very real one.

So much for the class of case, and the process of getting to a certain altitude under certain conditions.

OUTFIT.—How many people in the old country *have been* carried away with the idea that they are going to "Sunny South Africa," and that, therefore, only the lightest summer clothing is necessary. I say *have* been, because nowadays the Cape trip is so common that people at home are getting better informed with regard to the subject of outfit.

For most of the year the ordinary tweed clothing worn in Scotland is quite suitable—lighter texture in summer than in winter. Flannel suits are very good for summer wear. Woollen shirts and cricketing shirts with collars attached are very serviceable; although one who has been accustomed to wear starched shirts at home will find it quite convenient, and quite comfortable, to wear them at the Cape also. Under-flannels should always be worn, and, in the higher districts, it will be found that the very thickest procurable can be worn in winter. The patient should have two weights of socks—heavier in winter than in summer; although many people prefer to wear the heavy ones all the year round. Boots will be found, on the whole, to be more useful than shoes. Thick boots are required in winter.

Hats.—Soft felt hats, which are to be purchased in any town, are the most serviceable. Straw hats and caps are also useful.

Cholera belts.—Many derive much comfort from cholera belts, and they can be got of graduated weights. I think they do often prevent chills, especially in a country like this, where changes of temperature are often considerable and sudden. Once worn, however, they must always be worn!

Overcoats.—One heavy ulster and one light walking-coat, and a good mackintosh rug. He should have one good carriage rug, or, what is still better, a Kaross or skin rug. This latter is to be purchased in almost any town. A cushion is useful, especially when travelling, and when sitting about. Cardigan vests are found to be very useful in winter.

TIME OF YEAR TO ARRIVE AT THE CAPE.—Undoubtedly the best time of year to arrive at the Cape is in the end of November or beginning of December. The weather at the coast then, and during the summer, is drier than in the winter months, and this also applies most emphatically to the plateau of 1500 ft. altitude in the Ceres district. It is lovely there in November, December, January, February, and March, but later than that it gets damp.

April, as a rule, is a perfect month on the Karroo. In May it gets colder, especially in that part from the Hex River Mountains to Laingsburg. Beyond there the weather is never quite so cold, and there is little or no rain—the rainy season being in summer, when thunderstorms are frequent.

WITH REGARD TO OPEN-AIR TREATMENT.—This has, more or less, been in vogue for many years, although perhaps not to the extent to which it is carried in England and on the Continent of Europe. If these methods, now so much favoured, are good in the damp and variable climate of England, they must surely be at least equally good when superadded to the natural advantages of the Cape and its climate. For here, open air—real untainted open air—is always available to an extent that cannot in the faintest degree be approached at home. In England the "feeding" part of the treatment is certainly much more easily carried out; but, as I have already indicated, South Africa is now rapidly improving in that respect also.

Rainfall for 1900.

(From the Report of the Meteorological Commission.)

	Alt.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
	Ft.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Cape Town	88	0·46	0·50	0·96	1·48	3·27	1·64	4·17	3·11	1·44	2·31	0·76	0·69	20·79
Ceres Road	860	0·42	0·27	0·11	1·41	1·92	1·33	3·68	4·60	1·58	3·48	0·94	0·84	20·58
Ceres	1493	0·10	0·05	0·62	2·20	3·95	2·46	8·02	9·25	3·82	7·31	1·95	2·25	41·98
Tonws River	2500	0·07	1·17	0·87	3·68	0·18	0·49	0·89	0·82	0·24	1·66	0·64	0·97	11·68
Matjesfontein	2970	0·00	0·18	1·25	4·17	0·71	0·20	1·00	0·96	0·00	1·18	0·15	not taken.	...
Beaufort West	2850	0·98	1·53	2·00	0·33	0·30	0·14	0·75	1·12	0·00	0·20	0·03	3·47	10·85
Aliwal North	4330	0·00	0·00	0·00	1·84	0·33	0·83	0·34	1·43	0·00	0·48	0·00	3·66	...
Kimberley	4042	1·43	1·89	3·74	2·44	0·04	0·55	1·71	0·15	0·00	1·67	0·39	2·37	16·38
Colesburg	4470	Jan. × Feb. 2·10		1·15	0·99	0·42	0·48	0·84	1·79	0·00	0·22	0·09	5·07	13·15

THE COLLEGIATE TRAINING OF WOMEN.

By T. Claye Shaw, M.D., F.R.C.P., *Lecturer on Psychological Medicine, St. Bartholomew's Hospital, London.*

To the girls who are educated at the large collegiate establishments which are to be found in almost every large town, there is nothing comparable. The glamour of the whole life there, the magnificence of the buildings, the feeling that they are emulating the processes which are employed in the training of men, the intoxication of success in the examinations or of prominence in the athletic field,—all these combine to the rise of a new self, which is so special in its kind, so different from home or elementary school life, that many excuses must be made for the partisans of the system. There are, however, people who, knowing the inner life of this form of education, have legitimate doubts as to whether these forcing-houses of intellectual display do not in many cases overshoot the mark, and tend to create a class of women unsuited for the best social future which the parents have a right to expect, —best for the women themselves, and for the generation of which they form so important a part. Those best able to judge are the medical men who are attached to these institutions, and their experience is to the effect that stress of competition presses in too indiscriminate a way upon the young women who are brought together and educated in very large numbers.

Consulting-room histories of headaches, mental affections, break-downs, and irregularities, supplemented by accounts of the administration of bromides and other remedies, are common enough, and leave no doubt that, though a few may come out of the curriculum apparently none the worse physically, yet numbers suffer in that they either break down completely, or, being of little use in maintaining the literary reputation of the school, are left to join the common herd of make-weights, learning nothing that is of use to them, but possessed with the idea that they are being glorified by their surroundings. The indiscriminate massing of girls in large classes, of subjecting them to examinations regardless of their physical conditions at the time, of making them participate in severe muscular exercises,—in a word, of keeping them in a continued state of high pressure, is the fault of the system of training women to compete with men on platforms, which, though suitable to the one, are not so for the other. It is not to be denied that the experience of examiners at the universities and colleges is to the effect that the answers sent in by women are often as good, or even better, than those of the male candidates; but at what cost this is achieved is too often apparent afterwards in the results to the girls themselves, and in the course of their subsequent family and social relationships.

The forcing system is good neither for the quick-witted nor for the moderate or dull girls; perhaps, indeed, the former suffer the most, for their readiness at work and the pressure that is put on them to accomplish an end at all risk, though at times compassed with impunity, often ends in disaster and evil after-consequences. The woman who is placed on the same competitive platform as the man, is on her mettle to show that she is just as good as he is, and her endeavours to attain this equality or superiority are such as to tax her efforts in a large number of instances beyond her strength. And what are the material profits to them of these distressing efforts to rival or compete with men on the same platforms? In medicine they have had only a very moderate success at the best, often they have been conspicuous failures. They may obtain the coveted B.A. degree, and be appointed as mistresses or heads of colleges, but these prizes are not numerous, and the majority are left simply to glory in the fact that they are stamped with a mark which is not of much use to them. Does it make them better mothers, or better members of society in the way of companionship, of intellectual advancement, of aid in charitable work, or even of service in their own families? If the higher education is effectual, it ought to improve the status of women, to bring them into prominence, and cause them to be especially sought after in all the phases of social life; but that it really does so operate can be only partially affirmed. If the statistics of marriage of female graduates could be obtained, they would almost certainly point to the conclusion that scholastic excellence is not a very valuable asset in the matrimonial market, not so much because men are afraid of women with diplomas, as because the very course of study and the trend of mind which it creates seem to displace in the woman the marriageable attributes, to give them a feeling of independence and the desire of relying upon their own efforts, and to check that impulsiveness which, correct as it generally is in its demonstrations, has always been regarded as one of the most characteristic features of the female organisation. To the women who are successful in their university curriculum, the condition to which they have arrived is probably congenial; they find themselves on an intellectual plane which opens up paths of pursuits to which before they were strangers, and if, perhaps, the training has unfitted them for literary work in the higher flights of imagination, it has at any rate enabled them to take a place among the quiet workers in science and art who contribute to the synthetic result of some final development. This is of course an excellent thing in its way, and that women should have persevered against so much opposition, and have won, should have succeeded in finding occupation of a character so fitting to themselves, is an achievement of which they are deservedly proud; but it does seem as if the altruistic and sympathetic side of the woman's character is destroyed by the process of the new education, which substitutes a cold formalism for the warm spontaneity which dominates the majority of the sex.

After allowing that there are many women who do successfully attain the goal of their intellectual promptings, and in doing this have found their correct sphere of orientation, what is to be said of those who are indiscriminately placed on the same ways but are found to be impossible of completion for launching and trial? If it merely involved their withdrawal from the process when found unfit for training, and an adaptation of their education to their capabilities, nothing of a censorious character could be alleged; but such an adjustment is not found. Whether fit or not, the students are pressed into the same grooves which their more adaptable comrades negotiate readily; they are brought up to examinations and tests with a complete disregard of the physical injury entailed by the whip and spur of competition; and when they fail, as they must do, unless a timely breakdown saves them, they retire with a feeling of shame and disappointment, and with the sense that they must plod along an irksome road that leads to nothing. To some degree, what is predicated of the large colleges may be said of the smaller schools, but in the latter the strain of competition is not so great and things are not conducted at such a high pressure.

The remedy would appear to be found in the separation of women from men in university work. There ought to be distinct and separate universities for women, in which the tests imposed could be adapted to the organisation and faculties of the sex, and subjects introduced which are not possible under the existing system. Women do not like to confess that they are unequal to the intellectual tests to which men are subjected, and indeed no one wishes to deny that some of them are able to show excellence, and even occasional superiority, in the results; but those conversant with the facts know that much suffering is caused by the too general application of methods which are only suited to the few. And, apart from this question of competitive study, we may fairly ask if the kind of life in the large colleges affiliated to the universities is not one rather exclusive in its direction, insidious in its powerful corruption of the womanhood, in showing what the woman can be trained to do. The education, which is conducted on the same lines and in the same subjects as men; the ardent pursuit of identical games (so far, however, football has not established itself); the freedom and independence which are cultured, to the detriment of the practical nature of duty and self-effacement in the social and home life—in short, the elevation of the purely intellectual, and the disregard of the emotional side of the character: all these must issue in what is the great complaint of to-day, namely, that the restlessness of girls, the desire for change, the unwillingness to take up the very necessary, if at times irksome, duties of home life, are the result of a training which is false to the true interests of the race, when that training is employed without discrimination; for it ought never to be overlooked that, though the woman may be trained to a *vraisemblance* of the man's rôle in life, she does by the very act create a void which cannot be filled, because the man can never take the place of the woman, and the balance of the function is destroyed.

Whilst allowing to the few that they justify by their success all that the modern system claims in the "elevation of the standard of intellectual development in women," what can be said of its effect upon those who, unable to run in the race, are the disappointing laggards who linger in the track? There are no consolation prizes for them, and the training has unfitted them for the ordinary and unexciting course of social responsibility to which they are best fitted. They miss the idea of change and excitement, of the life which is selfish for its own ends, of the necessity for an outdoor existence, of the freedom from restraint to which they have been educated; and when they return to home life they find it devoid of variety, uninteresting, and so insupportable, that they seize upon every opportunity to realise the "high ideal" which has been held up to them without regard as to whether it was the right ideal for them; and so they leave home, or wander about helplessly, or give themselves up to "having a good time," in the endeavour to seek for what has been destroyed in them, namely, the true altruism, which would lead to usefulness by the performance of duties which it is their place to carry out. It is quite right, and it is of course a physiological necessity, that some field for the energy of young women should be provided; but it is here contended that the training of the day is too abstract and theoretical, that it is directed to the elevation without discrimination of a false ideal, and that it tends to the development of a useless personality, because the tendencies are all treated in the same way, regardless of innate differences. How different is the education of men! If a young man goes to a college with a special object, he has the opportunity of developing his bent; he can be specially prepared in art, science, philosophy, or what not; or, if he has no especial line, he is simply left and returned to those who sent him, without a cachet it is true, but he has at any rate had his opportunities, and these too in a regulated, non-oppressive manner. But for the ordinary girl there have been no opportunities, unless her inclinations have lain in the common groove. Why should not those who have aptitude for the domesticities not be specially uplifted in them—in cooking, in the making of clothes, in the keeping of accounts, in type-writing and shorthand, in any special subject for which they show bias, and be relieved of the useless expense of energy which is dissipated in the daily round of a treadmill education? One of the great difficulties in the way of individual treatment is the enormous size to which some of these establishments have grown. Where hundreds of girls are aggregated, it is quite impossible to specialise each pupil's capabilities, and though the results of this education *en masse* may be very satisfactory to the college chest, they are positively injurious to the greater proportion of young women, who leave without having learnt anything of much use, but with heads filled with exaggerated importance of the conditions under which they have been living. Truly should the father of a family hesitate before he commits his girls to a line of education. If they are brought up at home, the opportunity of making acquaintances and friendships is lost; if they are sent to colleges which are modelled after the manner of institutions for men, they are either over-pressed or practically neglected, in addition to which they become permeated with a tone not very conducive to subsequent peace and usefulness at home.

The numbers of women engaged in useful employment now-a-days is great, and is ever increasing, and the women are the happier and the better for it; but on looking around at those who are so occupied, one is struck by the fact that most of them are not of the kind trained in colleges; they are women who have specialised themselves in what they have felt to be their own spheres of excellence. In the curtailment of the size of colleges, in their specialisation and adaptation to individual requirements, and in the provision of separate universities for women, appear to lie the means for the best education, a training graduated to work without undue stress, and permeated throughout by the feminine spirit, which, strive as they may, no amount of imitation of men's methods will ever quite eradicate, though it may accomplish a bastard resemblance, which is full of peril to the woman, who has her own kind of superiority—a proprium of great price, if she only knows how to value it.

CLINICAL RECORDS.

A CASE OF CÆSAREAN SECTION FOR CONTRACTED PELVIS.[1]

By J. A. C. Kynoch, M.B., F.R.C.P.Ed., *Professor of Obstetrics and Gynæcology, St. Andrews University.*

Case.—I. Y., æt. 21, was delivered of her first child eighteen months ago. She had been in labour thirty hours, when repeated attempts to effect delivery by forceps, in Walcher's position, failed. Version was then resorted to, and a still-born, slightly premature, male child delivered, there being great difficulty in getting the after-coming head through the pelvis. She presented herself at the Dundee Maternity

---

[1] Read before the Forfarshire Medical Association, February 5, 1904.

Hospital on 6th December 1903, supposed to be about eight months pregnant. She is weak-minded, and could give no history relating to her pregnancy. The date of her last menstruation and of fœtal movements could not be ascertained. She was of healthy appearance—lungs, heart, and kidneys normal. She showed obvious signs of rickety deformity. Her height is 4 ft. 4 in.; there is antero-posterior curvature of both tibia, less marked in the bones of the forearm; there is considerable lordosis. The pelvic measurements are as follows:—Interspinous, 9 in.; intercristal, 9 in.; external conjugate, 6¾ in.; diagonal conjugate, 3¾ in. True conjugate estimated to be about 3 in. The pelvis is of the small, flat, rickety type.

Judging from the height of the fundus, the date of pregnancy corresponded to about the end of the eighth month.

Forceps and version having failed in her previous pregnancy, the alternative methods of delivery were—

(1) Induction of premature labour. (2) Craniotomy (forceps failing at full time). (3) Symphyseotomy. (4) Cæsarean section. Craniotomy was at once excluded, for, as Sänger has stated, "the medical practitioner who does craniotomy on the living child, in a case in which the patient can be removed to a hospital in order to undergo Cæsarean section, with preservation of the child's life, has fallen behind the requirements of the times."

The induction of premature labour would have been almost absolutely favourable for the mother, whilst for the child it would be almost proportionally unfavourable. It is estimated that, under favourable conditions, the immediate infantile mortality is not less than 30 per cent., whilst (what is frequently overlooked) the remote results, especially amongst the poorest class, living in insanitary surroundings, would probably come nearer 60 per cent. Further, a child delivered before the thirty-fourth week, and through a pelvis contracted to the degree I have stated, will very likely perish.

With regard to symphyseotomy, the degree of pelvic contraction in this case was perfectly suitable for this method of delivery. But its immediate mortality is not any lower than Cæsarean section, performed under the most favourable conditions. It permits of but does not deliver the child, and it prevents the patient being sterilised if this is deemed advisable. With the ever-improving results of the Cæsarean operation, the indications for symphyseotomy will probably be narrowed down to cases where forceps, in Walcher's position, fail, instead of being a recognised method of delivery, at a prearranged date.

The conditions being favourable, in the interests of both mother and child, for Cæsarean section, and it being desirable in this case to prevent further pregnancies, I decided to let the patient go on to full time, and do the operation at a prearranged date.

On 2nd January, the patient having been prepared as for an ordinary abdominal section, and before the onset of labour, I performed conservative Cæsarean section, after the method of Cameron. The child's back was directed to the left, head presented, heart sounds distinct. The abdomen was opened in the usual way, the incision extending from an inch above the umbilicus to 2 in. above the symphysis pubis. The uterus having been fixed in a symmetrical position, it was surrounded by large flat sponges. A flat vulcanite pessary was placed in the middle line below the fundus, and pressed on, in order to permit of the uterus being opened with a minimum loss of blood. The membranes being exposed, the uterine incision was extended downwards, the membranes ruptured, and the child delivered head first, the placenta attached to the posterior wall of the uterus being then easily detached. The uterus was then turned out of the abdomen, the edges of the incision everted, and the upper and lower angles compressed by my assistant. Eight deep and six superficial silk sutures were inserted into the uterine wound, the mucosa not being included. The Fallopian tubes were then tied and divided. The uterus responded well to sponge pressure, and, contracting satisfactorily, it was returned into the abdomen, and the abdominal incision closed in the usual way. The child, a female weighing 6 lb. 12 oz., was slightly asphyxiated, but soon responded to artificial respiration. With the exception of a rise of temperature to 101°, with rapid pulse on the second day, the after progress of the case was an absolutely satisfactory one. The child was put to the breast at the end of a week, and has been nursed throughout the period of convalescence.

There are a few points connected with this operation to which I might refer.

There has been difference of opinion as to the best time to operate. Thus, many believe that it is an advantage to wait till labour has begun; and some have even suggested the introduction of a bougie beforehand, to initiate uterine contractions. They think that, by so doing, there is less chance of hæmorrhage from uterine atony, and that a dilated condition of the cervix ensures easier escape of the lochial discharge. Both fears are probably groundless. The uterus contracts quite as readily before as after the onset of labour, and the cervical canal at the end of pregnancy is sufficiently dilated for drainage purposes. There are the further advantages always associated with operating at a prearranged hour, and less chance of extending the incision into the passive lower uterine segment, when the operation is undertaken before labour begins, and Sinclair of Manchester thinks that convalescence is more satisfactory.

With sponges well packed round the uterus, it is unnecessary to adopt Müller's suggestion of eventrating the uterus before opening into it, as this involves an unnecessary large abdominal incision. But after the uterus is emptied, and as a consequence diminished in bulk, the introduction of the uterine sutures is facilitated by bringing the uterus outside the abdomen.

By pressing the anterior uterine wall with a pessary, and incising in the middle, as recommended by Cameron, hæmorrhage during the operation is greatly diminished, and the necessity for placing a temporary elastic ligature round the neck of the uterus is unnecessary.

The transverse fundal incision, as recommended by Fritsch of Bonn, has never received much support in this country, and the median vertical incision is probably the simplest and best.

As a consequence of the increasing favourable results of Cæsarean section, a considerable number of cases are now on record where the patient had not been sterilised, and where the operation has been repeated. Quite recently, Sinclair and Spencer have recorded cases where the operation has been successfully repeated three times. The decision as to the question of sterilisation should, I think, be left with the patient. In the case I have brought before your notice, the patient's feeble mental condition prevented any discussion on the question, and this fact, in conjunction with her mother's desire that further pregnancies should be prevented, decided in favour of sterilisation.

The case further exemplifies the imperative necessity of getting the patient under observation before she is exhausted, as the result of prolonged labour, or made septic by repeated vaginal examinations or futile attempts at instrumental delivery. Our motto in these cases should be, "Operate early—delay is dangerous."

LACERATED WOUND OF THE HEART.

By Robert Cumming, M.B., and James M. Beattie, M.A., M.D.

(Plate XI.)

H. D., male, æt. 21, roperunner on the crane, of medium height, muscular, heavy build, and perfectly healthy.

History of accident.—He was in the act of removing a plank, which was lying on the props supporting the sides of a trench 18 ft. deep, when he lost his balance and fell into the trench. His body struck the corner of a skip—a heavy wooden box of about 1 ft. in depth. He rose up, and sat down on the edge of the skip, but immediately became very pale, and fell back dead. The time which elapsed between his fall and his death is said to have been about three minutes.

Examination of body.—On the left side was a long bruise, about 2½ in. in diameter. This commenced just outside and on a level with the lower end of the sternum, and became less marked as it passed upwards and inwards over the thorax. The fifth rib was fractured close to the cartilage. The muscle was bruised and torn, and a few small blood clots were lying on the pericardium, above and internal to the seat of fracture. The pericardial sac itself was undamaged, and was distended with blood serum and clots. With the heart *in situ*, only the upper end of the wound was visible.

Pathological report on the heart.—On the antero-lateral aspect of the left ventricle, and 2⅝ in. from the apex of the heart, there was a wound running upwards and backwards. The wound measured 1¼ in. in length, and at its widest part was ⅞ in. broad. The edges were very ragged. At a point ⅛ in. from its anterior end, the wound passed through the entire thickness of the heart wall. The perforation measured ⅛ in. in diameter. The anterior papillary muscle was torn across at its thickest part, and exactly opposite the perforation in the wall of the left ventricle. The ends of the torn muscle were very irregular and ragged. There was slight laceration of the endocardium and adjacent muscle of the left ventricle in the immediate neighbourhood of the perforation. At the base of the left ventricle, just below the tip of the left auricular appendix, there was slight extravasation of blood and some laceration of the muscle fibres, though the epicardium was not torn. The coronary arteries were quite healthy. On microscopic examination the heart muscle was found to be perfectly healthy.

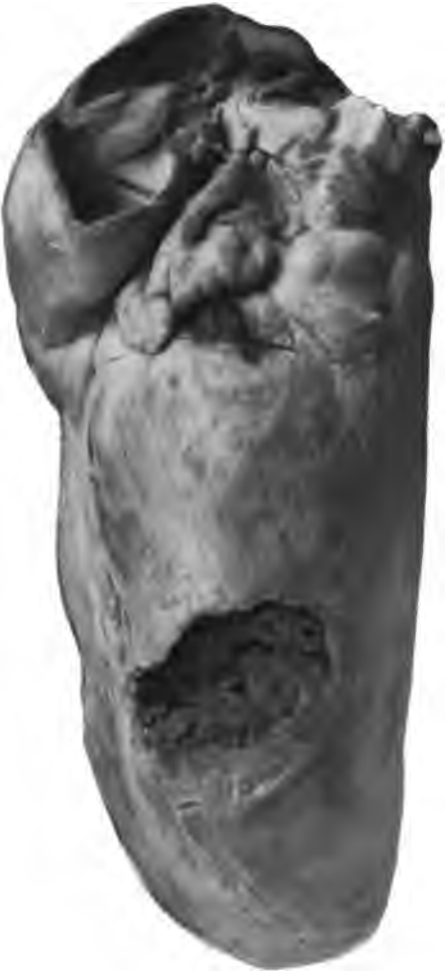
REMARKS.—The question that arises in this case is—Are we dealing with a rupture of the left ventricle or with a lacerated wound?

The history of the accident and the absolutely healthy condition of the coronary arteries and of the muscle of the heart practically exclude spontaneous rupture. Thus, the only two possibilities are rupture from external violence, the heart being at the time in a condition of diastole; or laceration of the heart from a fractured rib or from some other foreign body. As there was no wound of the chest wall, the laceration, if laceration it be, must have been caused by the fractured rib.

In the recorded cases of rupture of the heart from external violence, the left ventricle is the least common of the sites, and where there has been damage inside the chamber it has been simply a rupture of some of the chordæ tendineæ. We have not been able to find any case where the papillary muscles have been torn across, but one would naturally expect a tear to take place at the thinnest part of the muscle, not, as in this case, at its thickest part.

The severing of the papillary muscle at its thickest part, and exactly opposite that part of the wound which perforates the wall of the left ventricle, points, we think almost with certainty, to a laceration by the irregular end of the fractured rib. The position, and the upward and backward direction of the wound, and the fact that it was deepest near its centre, tailing off at each end, all point in the same direction. The fact that there was no wound of the pericardium is not inconsistent with our view.

The wound in the heart wall was certainly on a higher level than the fifth rib. Judging by the external bruising, the blow must have been struck in a direction which would drive the rib



Lacerated wound of Heart.

upwards and backwards in the direction of the apex of the axilla. The fifth rib, which received the main force of the blow, was fractured, and the fractured end was then driven violently upwards and backwards into the muscle of the left ventricle.

Our view, therefore, is that in the case before us, we have to deal with a lacerated wound of the muscle of the left ventricle and the anterior papillary muscle, caused by the irregular end of the fractured fifth rib being driven with great force into the heart—the rib carrying the pericardium with it and not lacerating it.

RECENT ADVANCES IN MEDICAL SCIENCE.

◆

MEDICINE.

UNDER THE CHARGE OF

A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,

MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

Diseases of the Œsophagus.

The diagnosis of œsophageal diseases, apart from the ordinary simple and malignant stricture, is often a matter of no little difficulty, and for this reason a short review of some recent papers on diseases of the organ may not be without practical interest.

Dilatation of the œsophagus without stenosis of the cardia is dealt with in a paper by Kelling (*Arch. f. Verdauungskr.*, Berlin, 1903, Bd. ix. Heft 3.) The subject of the article was a woman, æt. 69, who had always been in the habit of eating quickly and swallowing food in large boluses. At the age of 64 she suffered from post-diphtheritic paralysis of the palate, which was followed by difficulty in swallowing, unaltered food and quantities of mucus being returned without nausea, sometimes immediately after being swallowed, at other times after an interval of two or three days. Eating gave rise to a sense of pressure in the chest, which the patient could relieve either by ejecting food through the mouth, or by drinking water and straining so as to press it into the stomach. She regurgitated unaltered about one-third of all the food she ate; even when the œsophagus contained food, a soft tube passed readily into the stomach, which was in a state of gastroptosis. The stomach contents contained no free HCl. After temporary improvement the patient died, and general widening of an abnormally thick-walled œsophagus with a sacculum diverticulum just above the diaphragm was found. There was no obstruction at the cardiac orifice. In elucidation of the nature of the condition, the possibility of spasm was negatived by the easy passage of a soft sound. The suggestion that the case was one of secondary dilatation, following hypertrophy of the muscular coat of the gullet, from the long-established habit of hastily swallowing large masses of food, was also rejected in favour of a third hypothesis, which has not hitherto been propounded in similar cases, namely, that one layer of muscles was atrophied and the other compensatorily hypertrophied. Careful microscopic study of the œsophageal wall, with every precaution to avoid the fallacies incident to the fixation of the muscle fibres in varying states of contraction, demonstrated that, while the circular fibres were nearly twice the normal thickness, the longitudinal layer was atrophied. The latter lesion was primary and probably due to post-diphtheritic nerve degeneration. Normally the two layers, as in the bowel, contract and relax at different times, and a nerve impulse which contracts the circular layer allows the other to elongate. Atrophy of the nerve fibres going to the longitudinal group causes an overflow of nerve impulses to the circular layer, resulting in its hypertrophy. The paralysis of the longitudinal fibres, whose function it is to draw the wall of the gullet over the bolus, leads to difficulty in swallowing. The obstruction to food, though a sound could be passed into the stomach, was due to valvular closure of the cardia, from torsion of the elongated œsophagus. The diagnosis of this form of paretic dilatation of the gullet rests on obstruction to the passage of food, but not of a soft sound. A diverticulum may, however, give similar signs, or may be combined with paretic dilatation. This, as well as fissure, ulcer, etc., can be made out by œsophagoscopy, which should be employed in preference to the passage of a rigid bougie, the force required to overcome spasm of the cardia being more than enough to damage the wall. Helling uses cocaine locally to relieve such spasm, and can then pass a soft instrument in most cases. In all cases of dilatation of the œsophagus, the examination of the gastric contents is of importance. In paretic cases free HCl is often absent, probably on account of nerve degeneration. This test is, in practice, conclusive evidence of irremediable damage, and is therefore of great importance in the prognosis. The only treatment from which benefit is seen in these cases is the wearing of an œsophageal tube. Helling's conclusions are—(1) Some cases of œsophageal dilatation are caused by atrophy of the longitudinal fibres; (2) this is due to degeneration of the vagus, post-diphtheritic and other; (3) absence of free HCl from the gastric contents has the same cause and is of symptomatic value; (4) at the diaphragmatic opening, kinking is liable to occur; (5) the disease is incurable, and the best treatment is to wear a tube.

Œsophagoscopic diagnosis.—Starck (*München. med. Wchnschr.*, February 9, 1904) reports his experience of this method. He uses Mikulicz's œsophagoscope, the patient being in the lateral recumbent position with the head slightly bent back. By this means the whole œsophagus can be explored. The instrument is comparatively seldom required in the diagnosis of cancer, but errors in the localisation are often discovered by its means, as the tumour (itself too small to be an obstacle) may cause reflex spasm at the cardia, which is then thought to be the site of the tumour. It is scarcely possible to overlook cancer, even in its earliest stage, but should there be any doubt a small piece can be excised. Cases of neurosis should always be examined, as the negative result of sounding does not by itself prove that the case is purely nervous. In proof of this, Starck relates a case in which recent excoriation of the œsophagus, due to the accidental and forgotten swallowing of some fragments from a broken glass, was found in a case thought to be neurotic. In cases of diverticulum, dilatation, or distorsion of the œsophagus, the method gives indispensable information as to the exact nature of the condition. In dilatation the examination is often very tedious, on account of the obscuration of the visible area by enormous quantities of mucus, which block the tube and are very difficult to remove. In such cases the œsophagoscope is of great value in detecting the opening into the stomach and excluding stenosis. The technical difficulty of œsophagoscopy is slight, and with practice almost every patient can be examined; Starck has failed only twice in his last 100 cases. The procedure is perfectly safe, neither heart nor lung disease being a contra-indication. Starck uses oval as well as round tubes with elastic-headed obturators, which are removed after the cricoid is passed, the further introduction being conducted by the aid of vision. An assistant is required to steady the patient's head, which must not be hyper-extended (the commonest error). To find the centre of the lumen, or to examine any particular part of the wall, the instruments should not be moved from side to side, but the assistant should gently move the patient's head in the required direction.

Steiner (*ibid.*) in a short article reports a case of œsophageal carcinoma, in which the sound, when passed down to the stricture, in addition to showing the usual cardiac pulsation, moved synchronously with the respiration—a sign not previously noted, and explained on post-mortem examination by the fact that the large mass of cancer was fixed to the diaphragm.

Another new symptom, this time of œsophageo-tracheal fistula, is described by Adinot and Cadet (*Lyon méd.*, December 27, 1903). It consists in the dilatation of the stomach by the passage of air into it through the fistula. The patient had the ordinary symptoms of cancer of the gullet, which ulcerated into the trachea, rendering deglutition impossible owing to food reaching the air passages. At the palliative gastrostomy the stomach was seen to distend like a balloon at each inspiration and to collapse at each expiration, the movements of the walls adding greatly to the difficulty of suture. The mechanism of the passage of air into and out of the stomach is discussed at some length in the paper.

Sinnhuber (*Ztschr. f. klin. Med.*, Berlin, 1903, Bd. l. S. 102) has made a number of œsophagoscopic observations on man and the lower animals, on the *mechanism of closure of the cardia.* He finds that the orifice is normally in a state of contraction, which is reinforced by the circular fibres of the diaphragm and the oblique insertion of the œsophagus into the stomach. Division of the vagus at the diaphragm causes relaxation of the orifice; division high up causes temporary increase of the spasm, whence it is inferred that nerve impulses maintaining tonus originate near the diaphragm, while those lessening it come down on the vagus.

Involuntary air-swallowing in dyspepsia is the topic of an interesting paper by Mathieu (*Arch. f. Verdauungskr.*, Berlin, 1904, Bd. x. Heft 1). The patients are usually unaware of their habit, and complain of gaseous eructations and distension of the stomach. When, however, the eructations complained of are closely observed, it is seen that the patient closes his lips, bends the head a little forward, and swallows, the act being accompanied by a noise which he mistakes for the bringing up of wind. If the stomach be auscultated, an explosive ringing sound is heard as the air enters the organ. Sometimes the swallowed air remains in the gullet and is at once brought up again; at other times the swallowing goes on till the distension of the stomach reaches such a pitch as to overcome the spasm of the cardia, whereupon the air escapes with a rush. Sometimes air-swallowing is quite silently effected, and may result in a degree of gastric distension producing pseudo-anginous attacks. The swallowed air may pass on into the intestine and actually escape by the anus. As much as 200 litres of air have been collected from the mouth in a bad case of aërophagy. As to the mechanism, the actual movements are voluntary, but the patient imagines he is bringing up, not swallowing, air. Air may be introduced into the stomach either by swallowing, or by aspiration, as in the initial phase of vomiting. The habit is acquired in dyspepsia by the discomfort after food being ascribed to flatulence, to relieve which efforts to eructate are made. These, as stated, take the form of swallowing air, and the distension increases until finally relief is got by bringing up a large quantity of wind. The following clinical forms of aërophagy can be distinguished:—(1) *Slight aërophagy in nervous dyspepsia*, in which the attacks last for a short period after meals and are terminated by the escape of swallowed air through the mouth. (2) *Severe aërophagy in nervous dyspepsia.*—Here the air-swallowing may be continuous or periodic, and may be very painful and go on for hours at a time; it is sometimes nocturnal. The dyspepsia is intensified, and respiration and circulation are impeded by the enormous distension of the stomach. Nocturnal aërophagy may simulate an asthmatic attack, or suggest uræmic or cardiac dyspnœa. It is not unfrequently accompanied by migraine, and the patients are neurasthenic or neuropaths. (3) *Aërophagy in hysteria and neurasthenia.*—While cases of the second group merge into this one, hysterical air-swallowing may be quite silently carried out, and only shows itself by enormous tympanites. In such cases there are numerous other hysterical manifestations. (4) *Aërophagy complicating organic gastric disease.*—The essential of the treatment is to demonstrate to the patients that they *are* swallowing air. When the tendency to aërophagy comes on strongly, the mouth should be kept open, and if necessary a plug fixed between the teeth. The drugs indicated are gastric sedatives, and chloroform water during the attacks. Cases in which there is a pronounced neurotic element are the least satisfactory, and isolation is often needed.

Schlippe (*Arch. f. klin. Med.*, Berlin, 1903, Bd. lxxvi. Heft 5) reports on the *variations in atmospheric pressure in the œsophagus and stomach.* In the gullet, below the cricoid cartilage, there is a negative pressure of 3·5 mm. Hg; in the stomach, a positive pressure of 4 mm. Hg. In the œsophagus, the respiratory variation is only 0·5 mm. in ordinary breathing, in forcible breathing 8 mm., the pressure falling with inspiration and rising with expiration. In the stomach, with ordinary respiration, the reverse occurs; but in forcible respiration the curve is more complicated, there being a sudden inspiratory fall followed by a rise, and then an expiratory fall followed by a slight rise. Normally an average of 20 c.c. air can be squeezed from the œsophagus, while a patient with a diverticulum could express 80 to 100 c.c.

Schille (*München. med. Wchnschr.*, February 9, 1904) describes a simple device for the palliative treatment of cancer of the œsophagus.

He passes about 10 in. of ordinary perforated drainage tube through the stricture with a fine probang, and leaves it *in situ*. A thread attached to its upper end prevents it from slipping into the stomach.

Behrend (*Med. News*, Phila., December 19, 1903) records a warning series of three deaths, directly due to distension of the stomach with CO_2 for diagnostic purposes. The usual method with bicarbonate of soda and tartaric acid was followed. The patients were all old people; one died from hæmorrhage from a gastric ulcer, one died from hæmorrhage from a carcinoma, and one from exhaustion. In two of the fatal cases there was carcinoma of the cardiac end of the stomach, a condition which the writer thinks contra-indicates the employment of this means of diagnosis.

Strauss (*Berl. klin. Wchnschr.*, January 11, 1904) discusses at length an almost unique case of extrusion of a tubular slough of the greater part of the œsophageal mucosa, and obstructive hypertrophy of the pylorus after HCl poisoning. The patient lived for fourteen weeks after the accident. The literature of the subject is fully given.

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

LECTURER ON SURGERY, SCHOOL OF MEDICINE, EDINBURGH.

THE ORIGIN OF INFLAMMATORY FOCI IN BONE, AND THEIR RELATION TO THE BRANCHING OF THE ARTERIES SUPPLYING THE MARROW.

Lexer (*Arch. f. klin. Chir.*, Berlin, Bd. lxxi. Heft 1) discusses at length the conditions which influence the localisation of tuberculous and acute pyogenic foci in bone, and attempts to answer the following questions:—Why does acute osteomyelitis appear in such different forms, and why is the commonest seat of tubercle different from that of acute osteomyelitis? Also, why are staphylococci so often the cause of acute bone suppuration?

He shows, in dealing with the theory that bacterial emboli cause bone disease, that experimentally-produced suppurative and tuberculous foci appear in similar situations, and that these are the most common sites of tuberculous ostitis in the human subject, namely, the joint regions. This is explained by the arrangement of the vessels of the bones, which Lexer has investigated by means of mercury injections and radiograms. He divides the vascular supply of the marrow of the long bones into three systems—(1) The area supplied by the nutrient artery which sends its branches close up to the epiphysial line in a growing bone. (2) Small arteries entering the diaphysis at right angles to the long axis of the bone near the epiphysial line, termed metaphysial arteries, the branches of which may penetrate the epiphysial cartilage. (3) Arteries entering the epiphysis.

Lexer inclines to believe that all foci in the metaphysial and epiphysial regions are embolic, and he gives numerous illustrations in support of this view, both clinical and experimental. The short tubular bones have a relatively large nutrient artery during childhood and youth, and this is held to explain the frequency with which they are affected in young people.

Speaking generally, Lexer believes that foci infected by the pyogenic cocci do not commonly arise by embolic deposit, though some cases of localised osteomyelitis at the ends of long bones may do so; while tuberculous foci arise mainly through infective emboli or small clumps of bacilli, which lodge most frequently in the long tubular bones in the epiphysis or metaphysis, more rarely in the diaphysis. The paper is well illustrated by plates and drawings, and forms an interesting contribution to the subject.

Surgery of Tumours of the Brain.

Frazier (*Am. Journ. Med. Sc.*, Phila., Feb. 1904) discusses the recent advances which have been made in the surgical treatment of brain tumours, and, basing his views on his own experience and on a study of the literature, sums up as follows:—(1) All measures recognised as prophylactic of shock should be observed stringently. In these we have the most effectual means of reducing the mortality. The most important of them are—(*a*) The avoidance of prolonged operation; (*b*) the prevention of excessive hæmorrhage; and (*c*) the avoidance of unnecessarily rough manipulation of the brain substance. (2) A given area of brain can be exposed with the minimum degree of traumatism and greatest economy of time by the electric engine. (3) Temporary closure of the carotids in operations upon the brain is ineffectual and not unattended by danger. It should be reserved for extreme cases, and practised on one side only. (4) Observations on the blood pressure should be made immediately before and at frequent intervals during the operation. Object of same twofold: (*a*) as the most reliable index of patient's condition; (*b*) as the only exact method of determining whether operation should or should not be carried out in two stages. (5) Two-stage operation is indicated when there has been a decided fall in blood pressure after the relief from intracranial tension, such as follows reflection of the Wagner flap and dura. (6) Lumbar puncture as a means of relieving pressure is a temporary, not to say dangerous, procedure. (7) Bulging of the brain is one of the most embarrassing features of cerebral operations. A distinction may be made between that which occurs immediately after reflecting the dura, "initial" bulging, and that which follows as a result of subsequent exploratory manipulation, "consecutive" bulging. (8) "Initial" bulging is due to the increased tension exerted by a tumour. It is not always present, is often not excessive, and is not likely to be followed by "consecutive" bulging. (9) "Consecutive" bulging is due to the cerebral œdema set up in normal brain tissue by trauma inflicted by the exploratory manipulations. "Consecutive" bulging far exceeds in magnitude initial bulging, and suggests the presence of a tumour of considerable size at the seat of operation. (10) In order to avoid this "consecutive" bulging, exploration should be carried out in the most expeditious manner. (11) When the edges of the dural wound cannot be approximated without undue tension or without great laceration of brain substance, the gap should be closed by a graft taken from the pericranium, provided the tumour has not been found, and there is reason to question the accuracy of the diagnosis. (12) When there is every assurance of a tumour being present, but it proves to be irremovable or was imperfectly localised, no attempt should be made to close the dura, as in so doing the palliative effects of the operation would be counteracted. (13) Palliative operations should be regarded not merely as operations of propriety, but should be considered imperative, whenever the tumour cannot be found or cannot be removed. (14) A statistical study of the results of the last five years is encouraging. The mortality, both immediate and subsequent, has been reduced materially. Recurrence after operations for malignant growths of the brain is no greater than after operations for malignant growth of other structures.

THE INFLUENCE OF TRAUMA IN THE PRODUCTION OF MOVABLE KIDNEY.

HARRIS has made an interesting study of the influence of trauma in causing mobility of the kidney. In addition to going through the literature, he has analysed 1300 cases of railroad injury which he has had under observation. Among these there were forty-one cases of movable kidney, all in women, in which the question of a traumatic origin arose. Brief notes of these cases are given, and Harris concludes that in none of them was it even probable that the kidney was made movable by the accident. From observations he has made, he believes that movable kidney occurs only in women with a particular body form, which consists in a relative contraction or diminution in the capacity of the mid zone of the body. This body form is the chief predisposing cause of movable kidney, and, along with other factors which Harris enumerates, gives rise to the condition.

As the result of his study, Harris concludes—(1) Movable kidneys occur in women with a particular body form, and practically all women with this body form have movable kidneys of greater or less degree. (2) Movable kidney is not produced immediately, it requires time for its development. (3) While it is possible to injure, crush, or suddenly displace by violence a normally fixed kidney, such displacement is always accompanied by laceration of the perirenal tissues, which is manifested by distinct local and general symptoms. (4) Severe injuries involving the kidney are seldom or never followed by movable kidneys. (5) A movable kidney is never the immediate result of a single trauma.

RECURRENT DISLOCATION OF THE PATELLA.

GOLDTHWAIT (*Boston Med. and S. Journ.*, February, 1904) reports eleven cases of recurrent dislocation of the patella, with the results of operative treatment in seven of the cases. All his patients were girls or young women, and he is of opinion that the condition is peculiar to them. It develops at the period of rapid growth, between the ages of 12 and 16 years, is usually associated with flat-foot and sometimes with knock-knee, though marked knock-knee was present in only one of his eleven cases. The initial lesion may or may not be associated with the application of violence. Goldthwait finds that in the majority of cases the tibial attachment of the patellar tendon is distinctly farther to the outside than normal, making the pull of the thigh muscles on it less direct, and that with this the ridge on the outer side of the femoral articular surface is less marked than usual. Other associated conditions are laxness of the inner part of the knee capsule, undue length of the patellar tendon, etc. In extreme cases the patella may come to rest permanently on the outer aspect of the external femoral condyle. If the cases are seen early and the flat-foot corrected, Goldthwait believes that the knee condition may be cured without operation. In none of his cases, however, was this possible, and he had at the time of writing done thirteen operations on seven patients. The method which he has found most successful is that of bisecting vertically the patellar tendon, separating the tibial attachment of the outer half, passing it behind the inner and fixing it to the tibia internal to the tubercle by a silk suture. Of eight operations done in this way, seven gave an excellent result; and the eighth had not been long enough under observation to find out whether the good result was to be permanent. Goldthwait claims that by this operation the line of pull of the thigh muscles is sufficiently altered, and also that the outer half of the patella is braced down against the femoral articular surface more firmly, so that the risk of its slipping off the femur is lessened.

Mixed Tumours of the Salivary Glands.

Francis Carter Wood (*Ann. Surg.*, Phila., February, 1904) completes an elaborate study of these tumours with the following conclusions:—(1) There is a group of extremely complicated tumours occurring in the facial region, which contain elements from both epi- and mesoblast in most intimate relation to each other. (2) The complicated structure of the stroma, containing as it does elements such as embryonic connective tissue, cartilage, bone, fat, and lymphoid tissue, and very rarely striated muscle, is explained most easily by the assumption of an embryonic displacement of mesoblast. (3) The structure of the parenchyma is so slightly characteristic in morphology, that its epithelial nature in all cases can only be considered as probable; yet in about 24 per cent. of the tumours examined the presence of epithelium is undoubted. The form and relationship of the cells of the parenchyma do not furnish sufficient data to justify these cells being regarded as of endothelial origin. (4) The theory of early embryonic displacement of epiblastic tissue, during the process of formation of the parotid and submaxillary glands and the branchial arches, may account for many of the morphological peculiarities of the cells of these tumours, especially the lack of many typical features which we associate with epithelium. (5) The mixed tumours of the salivary glands run a clinical course strikingly different from the sarcomata and carcinomata, in that they are slow growing and generally benign. The regional lymphatic glands are not invaded, and recurrences are likely to remain local in a considerable proportion of the cases.

THE VALUE OF LEUCOCYTE ESTIMATIONS IN PERITYPHLITIS.

FEDERMAN (*Centralbl. f. Chir.*, Leipzig, 1903, No. 36) has examined 150 cases of appendicitis, with the view of determining the diagnostic value of the leucocyte count in that disease. He classifies the cases, all of which were operated on, as—(1) Appendicitis simplex, with sero-fibrinous exudate. (2) Circumscribed suppurative peritonitis. (3) Free, spreading peritonitis. He maintains that each type of the disease has its typical leucocyte curve, and that isolated leucocyte counts must not be relied on except when they are considered in relation to the usual curve for the type of disease under consideration. Twenty-five cases of appendicitis simplex were examined, and the conclusion reached was that these cases show a leucocytosis during the first two or three days, generally below 20,000 but sometimes up to 28,000. Therefore a count of 28,000 does not necessarily mean a suppurative process. After the first two or three days, the leucocyte curve follows the temperature curve till it returns to the normal. Seventy cases of localised suppurative peritonitis were examined. They showed that this form begins with marked leucocytosis, between 20,000 and 30,000, which generally falls to 10,000 or 15,000 in the first five or six days, and then either remains at this level when the abscess ceases to enlarge, or rises again with the extension of the abscess. Free spreading peritonitis also has its typical curve, twenty-six cases were examined. In the first twenty-four hours the count rises to 20,000 or 30,000, and for two days remains at that height or rises still further; from the fourth day onwards it falls, unless the patient is relieved, till death. The fall in the number of leucocytes indicates the commencement of a general poisoning of the patient. Federman sums up the results of his observations as follows:—The leucocyte count is a symptom of the disease, like any other. It is only of value when considered carefully along with all the other clinical signs and symptoms, especially the temperature and the length of time the patient has been ill. Without such careful comparison it is not only worthless but may be misleading. As a symptom it becomes of more value the longer the interval of time which has elapsed since the severe initial symptoms of an attack have passed off.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

F. W. N. HAULTAIN, M.D., F.R.C.P.Ed.,

PHYSICIAN FOR DISEASES OF WOMEN, DEACONESS HOSPITAL, EDINBURGH;

AND

J. A. C. KYNOCH, M.B., F.R.C.P.Ed.,

PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, ST. ANDREWS UNIVERSITY.

VAGINAL CÆSAREAN SECTION FOR ECLAMPSIA.

Westphal (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 46) reports the following case:—P., æt. 23, 3-para, six months pregnant, had three fits before coming under treatment. Os closed; fits recurred after injections of morphia. Pulse 130, small and irregular. Anterior uterine wall split in middle line to extent of 10 cms. Operation was completed in five minutes, dead child easily extracted; some post-partum hæmorrhage from uterine atony. Patient left the hospital on the fourteenth day. Westphal refers to the following supposed advantages of this operation:—(1) Rapidity; (2) no injury to surrounding parts, as may occur in ordinary rapid delivery; (3) less danger of infection; (4) easier than the high forceps operation, or perforation with incompletely dilated cervix. In the *Centralbl. f. Gynäk.*, Leipzig, 1903, No. 52, Ahlfeld criticises adversely this case. He thinks that at the end of pregnancy ordinary Cæsarean section is less dangerous than the vaginal operation, if such an operation is ever indicated for eclampsia. In the earlier months Ahlfeld regards Cæsarean section in any form quite unnecessary, as the uterus can be emptied quite satisfactorily by any of the dilating methods. Ahlfeld reports two cases, corresponding in every way to Westphal's, successfully treated by morphia and hot packs, labour in both cases terminating normally after cessation of the fits. Of thirty-two cases treated by morphia and hot packs, two died, giving a mortality of 6·23 per cent. Of those cases, in four the fits began before the onset of labour, which terminated normally in each case. He does not favour Bossi's dilator, as cases of severe hæmorrhage following its use have been reported by Zweifel and others. He believes that the uterine cicatrix after vaginal section may give future trouble, and the reflection of the bladder may also cause future discomfort.

PLACENTA PRÆVIA.

Nohel (*Ztschr. f. Heilk.*, Berlin, Bd. xxiv.) states that during a period of ten years there were fifty-five cases of placenta prævia out of 10,363 cases admitted to the Prague Maternity = 0·5 per cent.; 20 per cent. occurred in 4-paræ, 10 per cent in 2-paræ, 9 per cent. in 1-paræ, 62 per cent. terminated in premature labour, only 33 per cent. going to full time. Bleeding began early in cases of central insertion of the placenta, as contrasted with that occurring in the lateral variety. Abnormal presentations were frequent. Labour terminated spontaneously only in one case; version, in 72 per cent.; De Ribi's bag, three cases; Bossi's dilator, one case. The maternal mortality = 9 per cent.; of the children only 18 per cent. left the hospital well. In the case delivered by Bossi's dilator, version and extraction of a living child was effected in twenty minutes.

BLOOD EXAMINATION IN OVARIAN TUMOURS.

POZZI (*Presse méd.*, Paris, 1903, No. 70) examined the blood in twenty-three cases. He found that if the number of red corpuscles is normal, and the white corpuscles 6000 to 8000, the tumour was probably non-malignant. Diminution in the red cells, with increase of the white corpuscles, points to malignant degeneration.

TORSION OF THE PEDICLE IN OVARIAN TUMOURS.

HAMMER (*Deutsche Dissert.*, 1902) collected forty-three cases of contraction from a series of 248 ovariotomies. Of those, three (7 per cent.) caused sudden urgent symptoms, twenty-six (60 per cent.) slight recurrent symptoms, fourteen (32 per cent.) no symptoms, the condition being discovered at the time of operation. Torsion occurred in thirty-two cases of cystic growth (ten multilocular, twenty-two unilocular); four dermoids, one fibroma, one cysto-sarcoma, three parovarian cystic growths. The condition was found most frequently between 30 and 40, in one case it was found in a new-born infant. Of the tumours, twenty-three (52 per cent.) were left-sided, eighteen (41 per cent.) right-sided. Hammer agrees with Hofmeier that the condition is most frequently due to unequal rate of growth of the tumour, and he thinks pregnancy has very little influence in its causation. All the cases were treated by operation, with two deaths, the patients in those cases being collapsed on admission to hospital.

FŒTAL HEAD IN THE PARAMETRIUM.

WEBER (*Centralbl. f. Gynäk.*, Leipzig, 1904, No. 6) reports the following unique case:—P., æt. 25, 2-para, aborted at the fourth month, as a result of traction on the legs; the cervix being incompletely dilated, the head was separated. On examining the interior of the uterus, no trace of the head could be found, and it was supposed that it had escaped through a rent in the cervix into the abdominal cavity. On admission to hospital her general condition was satisfactory, but she complained of severe right-sided pelvic pain. On opening the abdomen, the uterus was found enlarged to the size of a four-months pregnancy. The peritoneum covering it was uninjured. A swelling was found between the folds of the right broad ligament, which was removed and proved to be the fœtal head. Weber refers to a somewhat similar case reported by Orthmann (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, 1898, S. 400), where, as the result of criminal abortion, the cervix was extensively lacerated, and through the tear the placenta and membranes escaped into the parametric tissue, necessitating abdominal section for their successful removal.

Advantages of Vaginal Drainage.

Oberlander (*Ztschr. f. Geburtsh. u. Gynäk.*, Leipzig, Bd. l. Heft 2) during a period of three years employed this method of drainage in thirty-nine out of 192 laparotomies = 20·3 per cent. The cases so treated are described in detail. The indications for drainage were—(1) Pus tubes = twenty-five cases; (2) ectopic gestation = six cases; (3) pelvic tumours = seven cases; (4) commencing peritonitis after perforation of the uterus = one case. Oberlander regards drainage through the posterior fornix, the abdominal wound being closed, as the best method in pelvic cases. In aseptic operations he uses ordinary sterilised gauze; for all other cases iodoform gauze is preferred.

Combination of Carcinoma and Tuberculosis of the Uterus.

Wallart (*Ztschr. f. Geburtsh. u. Gynäk.*, Leipzig, Bd. l. Heft 2) describes three cases of this condition. (1) P., æt. 55, adeno-carcinoma of the cervix, with distinct tuberculous lesion of the neighbouring part. (2) P., æt. 50, tuberculous pelvic disease, secondary to lung affection. The disease was well marked in the cervix, while the carcinomatous change was limited to the innermost part of it. (3) P., æt. 37, tuberculous disease of the uterine body combined with fairly advanced carcinoma of the cervix. In certain cases Wallart believes that tuberculosis of the uterus, especially when it affects the cervix, may predispose to the occurrence of carcinoma. The combination of those affections Wallart believes to be more common than is generally supposed.

THERAPEUTICS.

UNDER THE CHARGE OF

RALPH STOCKMAN, M.D., F.R.C.P.Ed.,

PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY;

AND

FRANCIS J. CHARTERIS, M.B.,

ASSISTANT TO THE PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY.

Subcutaneous Administration of Albumin.

Credé postulates the following conditions for any preparation that is to be used subcutaneously:—

It must be soluble in water, and capable of being boiled without coagulating. It must not cause much pain or local irritation. It must be assimilable and capable of being utilised for the building up of cells, that is to say, it must not be excreted in the form of unchanged albumin;

and, lastly, it must not be either toxic to the system in general nor irritating to the kidneys. It is manifestly very difficult to find a preparation which will fulfil all these conditions, but after experimenting with many different preparations Credé has discovered one which has proved suitable. Kakodal, as the substance is called, is prepared from meat, and consists of easily soluble albuminous substances, with traces of phosphates, iron, and sodium chloride. The powder dissolves readily in water. Up to 10 to 12 per cent. the solutions are quite fluid, but higher percentages give thickish solutions which tend to become gelatinous. The best solvent is physiological salt solution. The new preparation has been tried in many conditions, chiefly such as prevented the patients feeding themselves, by persistent vomiting, intestinal obstruction, etc. As ordinary dose, Credé gives 5 grms., dissolved in 50 c.c. saline solution, as this 10 per cent. solution seems most easily absorbed. This is either given with a syringe, or it is added to 500 c.c. of saline solution and run in from a funnel connected with two needles. The amount of albumin represents that of an egg. After the injection the uric acid increases, and the urine for some hours may contain traces of albumin. When 20 grms. were given at one time, the urine contained considerable quantities of albumin for the next three days, so that about 7 per cent. was thus excreted. At present 5 grms. are given every six hours, and in this way the kidneys are not irritated. Credé thinks that an emaciated patient of 55 kilos requires about one-third of the normal quantity of albumin = 80·7 grms., so that his minimum requirement is 27 grms., or about five eggs daily. This amount can be, as a rule, given partly by subcutaneous injection, partly by rectal injections, so that in critical days the heart may be nourished. It is, of course, difficult to demonstrate this directly, but Credé believes that in many cases the subcutaneous use has greatly helped the patients to survive critical days and operations. As a matter of practice, he strongly advocates adding 50 c.c. of the 10 per cent. kakodal solution to half a litre of salt solution wherever a saline infusion is indicated. The needles should be introduced only where the skin and fascia are loose. Slowly injected there is little pain. Even if a distinct feeling of tension and pain is caused, it passes off without any harm. A sterilised solution can be readily obtained by boiling or by exposing the solution to the action of strain. Such solution subsequently keeps for months without decomposing.—*Munchen. med. Wchnschr.*, 1904, No. 9.

INTRATRACHEAL INJECTIONS IN PHTHISIS.

MOORHEAD has used direct injections for the past twelve months in Sir Patrick Dun's Hospital. He employed a mixture of izal and glycerin, according to the formula of Colin Campbell. It is claimed that the injections are easy and cause no discomfort, while they directly disinfect the sputum *in situ* and destroy the breeding place of the bacteria. At the same time the injections impress the patient that something is being done for him. The disadvantages are, that they require the attendance of the patient once or twice in the day. As the result of treating nine cases, Moorhead is inclined to be in favour of this method of treatment. His conclusion is, that even if only given once a day thrice in the week, izal injections are of decided benefit, at any rate as an adjuvant to constitutional treatment. Nearly all the patients feel better, while breathlessness is easier, sweats cease, and the expectoration diminishes. This good effect is limited to chronic cases. In rapidly advancing cases it may do harm by increasing the pulmonary secretions. In cases complicated with laryngeal infection it should not be employed, as there is the danger of driving down the bacilli and infecting healthy lung tissue. —*Dublin Journ. Med. Sc.*, January, 1904.

When should a Strict Milk Diet be stopped in Scarlatina?

Gallois holds that the kidney complications are due to direct infection from the naso-pharynx. As long as the naso-pharynx is involved, there is always the danger that the kidneys may be affected. To avoid renal complications, the upper respiratory passages must be carefully disinfected. As soon as the naso-pharynx has recovered, the strict milk diet can be departed from without risk of setting up nephritis. Gallois admits that in order to follow this rule it is essential to know very thoroughly the course of naso-pharyngitis, so as to be absolutely certain when the last trace of it has disappeared.—*Bull. gén. de thérap.*, Paris, March 8, 1904.

Atropine Intoxication.

Stahberg reports the case of a man who received an overdose of atropine sulphate, through some badly made pills which should only have contained $\frac{1}{240}$ gr. of atroph. sulph. There were the ordinary symptoms—of dilated pupils, husky voice, with delirium and hallucinations. Two unusual aspects were, marked frequency of micturition and no elevation of temperature. The treatment employed was oral administration of morphia and pilocarpine hydrochloride.—*Am. Journ. Med. Sc.*, Phila., March, 1904.

Carcinoma of the Breast treated with Massive Mercuric Cataphoresis.

Massy gives an account of a case successfully treated by this electrochemical method of destroying and sterilising the cancerous growth. The patient was a woman, æt. 57, who for seven months had noticed a growth in her breast. At the time of operation the growth measured about 2½ in. in diameter, and was movable on the chest wall. The skin, however, was involved, and there was an area of ulceration about the size of a dollar. In the axilla there was an enlarged but movable gland. The patient was put on a spring cot with a large negative pad in moist contact with the entire back, and under general anæsthesia the active electrodes of zinc coated with mercury were inserted, one at a time, into the growth near its periphery. They were connected with the positive pole of an apparatus with a pressure of 160 volts, and a current of about 200 milliampères to each electrode was gradually turned on. The active electrodes were connected with one wire coming from the positive pole, and three or four were employed simultaneously, the total current in circuit being raised to 720 milliampères in about twenty minutes. A point was also placed in the axillary gland. From time to time, when a sufficient necrosis had appeared round it, a point would be removed. Within a few minutes the characteristic whitish-grey necrosis appeared round each point, and at the expiration of an hour and a half the whole gland, the diseased mammary gland, and the intervening tissues, had been necrosed bloodlessly, and a considerable zone round the necrosed area rendered sterile as regards outlying cancer cells. A piece of the growth removed before the cataphoresis showed a typical carcinomatous appearance. The necrosed area gradually healed, leaving a healthy scar, which at the present time, twelve months after the operation, presents no appearance of recurrence. Massy claims that cataphoresis kills the growth, together with all infected cells, without loss of blood, by a process which makes operative re-infection of the wound impossible. At the same time any outlying infected cells are destroyed; and, lastly, it is possible to cure a cancer without sacrificing the whole breast.—*N. Y. Med. Journ.*, Dec. 5, 1903.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

R. F. C. LEITH, M.B., F.R.C.P.Ed.,

PROFESSOR OF PATHOLOGY, THE UNIVERSITY, BIRMINGHAM.

The Effect of Filtration on the Virus of Hydrophobia.

Remlinger (*Ann. de l'Inst. Pasteur*, Paris, 1903, tome xvii. p. 834) found that the hydrophobic virus was inactive after filtration through a Chamberland filter B or F, but not after filtration through a Berkefeld V. When a homogeneous emulsion of the brain of a rabid rabbit, after filtration through a Berkefeld filter V, is inoculated under the dura mater, 30 per cent. of the animals experimented on take hydrophobia, but the duration of the period of inoculation is prolonged from eight to twelve days. Subcutaneous injection of the filtered virus completely immunises the rabbit against an intra-cerebral injection of standard virus. But if a Berkefeld filter W or a Chamberland filter be used, no immunisation follows. This seems to show that the germ of hydrophobia is able to pass through the pores of a Berkefeld filter V, but not through those of either the Berkefeld W or the Chamberland filters.

A Bacillus of the Rat resembling that of Plague.

Neumann (*Ztschr. f. Biol.*, München, 1903, Bd. xlv. S. 450) isolated a bacillus, resembling the plague bacillus in culture morphologically, and in certain respects in its effects upon animals, from the lungs of rats which succumbed to a pneumonia. Subcutaneous inoculation of the bacillus in rats had no effect, but entrance into the alimentary canal or the lungs had. A serum capable of agglutinating the plague bacillus had no effect on this rat bacillus.

ACTION OF RADIUM ON THE AGGLUTINATING PROPERTY OF THE BLOOD OF TYPHOID PATIENTS.

JAGN (*Vrach*, St. Petersburg, December 9, 1903) has investigated the action of a salt of radium (bromide of radium) upon the blood in nineteen cases of typhoid fever. They were of different ages and sex, and the agglutinating power varied considerably in each case. He found that if the radium was allowed to act long enough, two to three days, upon the serum, it completely destroyed its agglutinating power, a shorter exposure causing it to be weakened in proportion. He attributes this influence of the radium to the β-rays.

ON THE BRANCHING OCCASIONALLY EXHIBITED BY THE DIPHTHERIA BACILLUS.

ABBOTT and Gildersleeve (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, December 18, 1903, Abth. Originale, Bd. xxxv. No. 3) have investigated the branching of the diphtheria bacillus, with a view to determine if it was constant in certain media, and if it was of physiological or pathological significance. They conclude that, far from being constant, it is rarely exhibited on any media, that it is not a true mycelial formation, and is of pathological rather than physiological significance, being evidence of an involution or degeneration consequent upon development in an unfavourable environment.

A STUDY OF VOLUME INDEX, *i.e.* OF THE VOLUME OF THE RED BLOOD CELLS IN VARIOUS DISEASES.

CAPPS (*Journ. Med. Research*, Boston, December, 1903) has written a very interesting paper upon this subject. He argues that a red cell that is enlarged and pale owes its increase in size to endosmosis of fluid and loss of Hb, while one that is small and pale owes its Hb impoverishment to nutritional or degenerative disturbance. Likewise, a macrocyte rich in Hb must result from abnormal cell development. He determined the volume index by first measuring the mass of red cells by means of the hæmatrocrit, and then counting them by the hæmacytometer. The percentage volume of the red cells divided by the percentage number gives the volume index or percentage volume of each red cell. He gives tables of his results in ten normal cases, in thirty cases of pernicious anæmia, in fifty-one cases of secondary anæmia, in twenty-one of chlorosis, and in fifteen of nephritis with dropsy. He concludes that—(1) The volume index is more reliable than diameter measurements. (2) The cell volume is invariably increased in pernicious anæmia and usually more so than the Hb content of the cell. This heightened volume index is a more constant and trustworthy sign of pernicious anæmia than the increased colour index. The increased Hb content is due to an increase in cell volume, and not to an increased affinity of the protoplasm for Hb. (3) The moderate cases of secondary anæmia show only a slight loss in cell volume, but if the anæmia is high the cells become small and atrophic. (4) In a large proportion of chlorotics the cell volume suffers as well as the Hb, although always to a less extent. Patients with a normal or nearly normal volume index recover quickly even if the Hb is much deficient, whereas those with a low volume index recover slowly. The cell volume has more to do with the rate of improvement than the Hb content. (5) In all anæmias the colour loss is greater and more rapid than the loss in volume, but recovery in volume must occur before the colour reaches normal. (6) The Hb content of a normal erythrocyte is $\frac{1}{1}$; if it rises above this, an increase in cell volume may be safely deducted. Super-saturation of cell protoplasm with Hb probably does not occur. (7) Cell volumes seems to be chiefly altered by influences affecting all growth or degeneration. The large erythrocytes of pernicious anæmia are probably young cells. Small cells may result from a malnutrition of the bone marrow, as in chlorosis, or from an actual degeneration, as in sepsis. (8) Dropsy, cyanosis, the hydræmia following acute hæmorrhage, do not materially alter the volume of the cells. The cell volume, therefore, suffers remarkably little change from osmotic influences.

SOME OBSERVATIONS ON THE POISON OF THE BANDED KRAIT (*Bungarus fasciatus*).

CAPTAIN LAMB continues his investigations into certain snake poisons. It will be remembered that, in previous papers, he upheld that no conclusions can be drawn regarding the action of the poison of one species of poisonous snake from the observations made on the action of the venom of another species, no matter how closely allied to each other the two species may be. The venom of each species must be studied separately. He has therefore taken up the study of the poison of the various species of the poisonous Indian snakes, and has already published some observations upon them. He now publishes (*Scient. Mem. Med. and San. Depts. Indian Govt.*, Calcutta, 1904, New Series, No. 7) certain results, and conclusions drawn from them, as to the action of the poison of the banded krait. They are as follows:—(1) Cases of intoxication with the venom of *Bungarus fasciatus* can be divided into three classes—(*a*) Cases in which rapid death, due to intravascular thrombosis, follows intravenous injection of large quantities of venom. (*b*) Cases which present acute nervous symptoms, and which terminate fatally within two or three days after the injection of the poison. These cases are indistinguishable, so far as the symptoms are concerned, from cases of cobra venom intoxication. (*c*) Cases which run a chronic course and end fatally between the sixth and twelfth days after the injection of the poison. Such cases are peculiar to intoxication with this venom and present marked special symptoms. A histological examination of the nervous system in these cases shows a well-marked primary degeneration of the cells of the cerebral nervous system. (2) The venom of the banded krait injected directly into the blood stream (*in vivo*), in considerable quantity, produces intra-vascular thrombosis which may be fatal. In the more or less chronic cases of intoxication there is a deficiency in the blood coagulability, but this deficiency cannot be said to be a factor in the etiology of any symptoms observed. No definite results were obtained with citrate plasma (*in vitro*). (3) The venom has only a slight destructive action on the red blood corpuscles, which has little or no influence upon symptoms. (4) The venom of the banded krait is much less toxic than that of either the cobra or the daboia, and it is not neutralised either by the serum prepared by Calmette or by a serum prepared by Tidswell of Sydney with the poison of another colubrine snake, namely, *Hoplocephalus curtus*, the Australian tiger-snake. It has been formerly shown that a serum which is highly antitoxic for the venom of *H. curtus*, has no neutralising power for cobra poison, and that the same is true of the cobra for the daboia.

EFFECT OF ANTI-MALARIAL OPERATIONS.

JAMES (*Scient. Mem. Med. and San. Depts., Indian Govt.*, Calcutta, 1903, New Series, No. 6) gives in his first report particulars and results of the anti-malarial operations at Miam Mir. The methods used were:—(1) The breeding places of the mosquito, the pools, watercourses, etc., were either cleaned or treated with kerosene. (2) The removal of a number of people to a distance from all breeding places of the mosquitoes. (3) The administration of quinine to infected persons. (4) Prophylaxis by the administration of quinine. The first method is very valuable, if it can be carried out thoroughly enough, but he doubts if anything short of a *permanent* extermination of all possible breeding places will produce a marked diminution in the number of *Anopheles* mosquitoes. His efforts in this direction at Miam Mir during the first year of trial met with little success. The second method, namely removal, is not practicable except in special cases. The third and fourth, namely, the administration of quinine, both as a curative and prophylactic agent, to the native children, whenever they are gathered together in large numbers in the vicinity of European troops, he found to be of the greatest value.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF

P. M'BRIDE, M.D., F.R.C.P.Ed.,

CONSULTING SURGEON TO THE EAR AND THROAT DEPARTMENT, ROYAL INFIRMARY, EDINBURGH,

AND

A. LOGAN TURNER, M.D., F.R.C.S.Ed.,

SURGEON FOR DISEASES OF THE EAR AND THROAT, DEACONESS HOSPITAL, EDINBURGH.

SUPPURATION IN THE LABYRINTH, AND INTRACRANIAL INFECTION THROUGH IT.

THE subject of suppuration in the internal ear has been discussed in literature on several occasions during the last two or three years. It deserves the serious attention of the aural surgeon, both on account of the damage which it may inflict upon the function of hearing, and because of the undoubted risk of intracranial infection which may follow a septic condition in that situation. A comprehensive paper on the subject was read by Milligan at a recent meeting of the Otological

Society of the United Kingdom, and is published in the *Journ. Laryngol.*, London, March, 1904, and many points of interest are dealt with in it.

The most frequent and also the most important cause of labyrinthine suppuration is the extension of the same process from the middle ear. Either perforation, from erosion of the outer labyrinthine wall, takes place, or the infection spreads through the foramen ovale or through the membrane covering the fenestra rotunda. Causes of less frequency are traumatic in origin, either as the result of fractures of the base of the skull, or from the introduction of foreign bodies through the external auditory meatus. In some cases the inflammatory process is a slow one, and cario-necrosis of the whole or part of the labyrinth may result. On the other hand, an acute infection may lead to intracranial infection, the organisms passing along the course of the auditory and facial nerves, and thus reaching the brain and its membranes. Hinsberg (*Arch. Ophth. and Otol.*, N.Y., 1902, vol. xxxi.) traces the path of infection in a series of statistics. In 198 cases it was definitely established in sixty-one. In twenty-seven a fistula was found in the horizontal semicircular canal; in seventeen, the route taken was through the fenestra ovalis; in two, through the fenestra rotunda; and in three, through both windows. In seven, the fistula was situated in the promontory, and in eight in the posterior or superior semicircular canal.

In the majority of cases, the infection from the labyrinth attacks the cerebellar fossa. As a rule, a diffuse meningitis results, though occasionally a limited suppurative process results. The greater proportion of cerebellar abscesses are due to labyrinthine disease.

Septic invasion of the labyrinth may run an acute or chronic course. In an acute case, the following symptoms may present themselves:—Deep-seated pain, rapid elevation of temperature, sickness or nausea, and marked vertigo, compelling the patient to lie down. Nystagmus, too, may be observed, and rapid nerve deafness supervene. In chronic cases, on the other hand, the symptoms are not so pronounced—for instance, pain is frequently absent, vertigo is not so marked, and sickness is by no means constant. If such symptoms, however, are combined with a rapid onset of nerve deafness and the frequent presence of nystagmus, there is every probability that the labyrinth has become affected. Facial paralysis, too, which is usually regarded as an accompaniment of middle ear disease, may really be evidence of the internal ear involvement. Milligan lays some stress upon this point, as in his experience it frequently indicates a labyrinthine lesion, the nerve being implicated in its passage through the pars petrosa before it has reached the middle ear.

A practical difficulty that arises in connection with these cases is the differential diagnosis between a simple labyrinthine suppuration, an abscess in the cerebellum, and a combination of the two conditions. A diagnosis is sometimes extremely difficult. Milligan summarises the symptoms to guide us in the recognition of the different lesions. In uncomplicated labyrinthine suppuration there is usually a greater degree of nerve deafness, vertigo is more of the nature of a subjective sensation of extreme dizziness than of that form of staggering gait known as cerebellar gait; sickness and prostration are less marked than in the cerebellar condition; occipital pain and retraction of head are absent, and there is not the dull somnolent state of the patient which is seen in brain abscess. There is no optic neuritis, no yawning, and the patient does not lie in the coiled-up position which is suggestive of the cerebellar lesion. Nystagmus is comparatively common when the labyrinth is affected. Jansen and Lucae found it present in all their traumatic cases. The former observer found it present in twenty-four out of ninety-seven instances where the inner ear was involved in a suppurative process, and Lucae found it in 31 per cent. of his cases of fistula of the external semicircular canal. Where cerebellar abscess and labyrinthine suppuration coexist, the diagnosis may only become possible in the course of operative procedures, or as the result of the after-history of the case. Milligan details a case in which both conditions were present, though the abscess was not recognised until after the labyrinth had been operated upon. The patient had suffered from chronic suppuration in the left middle ear, with caries of bone and granulations. His temperature on admission was 102° F., pulse 64, and respirations 20 per minute. The patient had suffered for two or three days from severe dizziness, and had been more than once sick. The complete mastoid operation was performed, with the object of exposing the outer labyrinthine wall. A sinus was found in the region of the horizontal semicircular canal leading into the inner ear. A small sequestrum was scooped out, along with some granulation tissue. After the operation the temperature became subnormal, the patient became dull and listless, occipital pain slightly increased, and there were one or two attacks of vomiting. The cerebellum was therefore explored and an abscess evacuated.

Another difficulty sometimes presents itself—the symptoms of a pure labyrinthine suppuration may so closely resemble symptoms of cerebellar abscess as to lead to a diagnosis of a mixed lesion when the labyrinth is the part alone involved. Apparently symptoms of increased intracranial tension may arise, denoted by slowing of the pulse, subnormal temperature, and slow respiratory movements, thus increasing the difficulty in the diagnosis.

Labyrinthine suppuration must naturally be looked upon as a condition of gravity. Not only is audition destroyed, but the graver risk of intracranial mischief must be borne in mind. Milligan believes that in 40 to 50 per cent. of these cases intracranial infection arises. Cerebellar abscess, in particular, may originate from infection through this pathway. Brieger reports five cases of meningitis, in all of which the meningitis was due to a concealed labyrinthine suppuration. Sinus phlebitis may also arise in this way.

The Treatment of Atrophic Rhinitis by Injections of Paraffin.

Attempts have recently been made to cure, or at any rate to alleviate, the distressing symptoms of ozæna, by restoring the interior of the nose to its normal calibre. Moure and Brindel have published their results in a large number of cases (*Rev. hebd. de Laryngol.*, Bordeaux, 1903, No. 41). Out of 133 cases which were kept under observation, seventy-six were cured, thirty-three were improved, and fourteen were unimproved. We cannot fail to be struck with the enormous number of cases of atrophic rhinitis which these observers appear to have met with, and it seems just to assume that some of them must have been examples of atrophy of a very slight degree. The nasal cavity is thoroughly cleansed beforehand. A special syringe and curved needle are used, and the latter is introduced beneath the mucous membrane, usually of the inferior turbinated body. It is advisable to make the injection into the posterior ends in the first instance, and then at a subsequent sitting the anterior part of the turbinated body may be reconstructed. Injections have not been limited to this area of the nose, but even the septum, the floor, and the middle turbinated have been treated in a similar manner. In some cases the atrophy of the mucosa is so pronounced that it is impossible to introduce any paraffin between it and the bone. In such a case, injection of the septal submucous tissue would assist in narrowing the too roomy nasal cavity, and help to bring about the desired result.

Certain complications may arise in connection with paraffin injections. Phlebitis of the facial vein has occurred in more than one case, pain in the course of the vessel and some swelling of the cheek occurring. Neuralgic pains are usually transitory. Any treatment which is accompanied by even a fair measure of success should be welcomed in so distressing a condition as fœtid atrophic rhinitis.

PUBLIC HEALTH.

UNDER THE CHARGE OF

J. BUCHANAN YOUNG, M.B., D.Sc. (Public Health),

ASSISTANT TO THE PROFESSOR OF PUBLIC HEALTH, UNIVERSITY OF EDINBURGH.

The Preservation of Milk.

Renard (*Rev. d'hyg.*, Paris., tome xxvi. No. 2) gives his experience as to the preservation of milk by means of the addition of peroxide of hydrogen. In fresh milk which has had added to it not more than 2 per cent. of peroxide of hydrogen water (charged to 12 volumes), equivalent to 0·06 grm. peroxide of hydrogen per cent., at the end of six or eight hours the peroxide is decomposed into water and nascent oxygen, and no trace of it is to be found. The causes of its disappearance are somewhat obscure, and the rate varies with the nature of the milk. Some milks can decompose from 2 to 3 per cent. of the peroxide water in from two to three hours, while others require seven to eight hours to produce the same effect. Beyond 3 per cent., complete decomposition is, as a rule, slower, although some milks can decompose even 5 per cent. in a few hours, but in most cases the decomposition is not complete at the end of a month. Temperature seems to have little effect on the rate of disappearance. It is to be noted that in milk which has been boiled, or heated to 70° C. (167° F.), the peroxide, instead of rapidly disappearing, forms with the constituents of the milk, modified by heat, stable compounds which are only very slowly broken up.

In practice not more than 3 per cent. should be added to fresh milk, and that as soon as possible after milking. After the addition of the peroxide the milk is left for six to eight hours in a cool place before delivering to the consumer. Milk treated in this way does not differ in taste or smell from fresh milk, and is coagulated by rennet in the same way as fresh milk. It is not *sterilised*, but remains unaltered for a much longer time than ordinary milk. Kept at a temperature of 52° F., a sample of milk began to turn sour at the end of twenty-four hours. The same milk, with 1 per cent. of peroxide water added, did not sour until eighty hours, with 2 per cent. not until ninety hours, and with 3 per cent. it only soured after ninety-five hours' keeping. At 68° F. the natural milk soured within thirteen hours, while, with 1, 3, and 5 per cent. of the solution added, it kept sweet for twenty-four hours, twenty-six hours, and thirty-two hours respectively.

To test the suitability for infant feeding of milk preserved in this way, Dr. Debout conducted a series of experiments in connection with one of the dispensaries in Rouen, in the summer of 1902 (April to October). Fifty-seven infants were entirely fed on the milk. Among these there were ten deaths, eight being from diarrhœa, one from meningitis, and one from bronchitis, giving a mortality of about 17 per cent., or, taking only the deaths due to diseases of the alimentary tract, 14 per cent. In Rouen, during the period of experiment, there were 1431 births and 391 deaths of children under 1 year, giving an infantile mortality of 27 per cent. Dr. Debout considered that the milk was well borne by the children, their nutrition being perfect and their increase in weight regular, and that, taking into account the deplorable conditions under which the children were for the most part reared—negligent mothers, improper feeding-bottles, etc.—that the result was good.

Nicolle and Duclaux (*ibid.*) contribute an important paper containing the results of experiments conducted by them on the preservation of milk, by the two methods which, it is claimed, do not alter the chemical and physical properties of milk, namely (1) refrigeration, and (2) the addition of peroxide of hydrogen. Their results show the influence of these two methods on the micro-organisms contained in milk or which may gain access to it. As regards refrigeration, they found in one case that a sample of milk which contained, half an hour after milking, 18,000 micro-organisms per c.c., when kept in an ice-chest at 50° C. (41° F.), after ten hours contained 14,100 per c.c., and after twenty-four hours 10,800 per c.c. The same milk kept at 14° C. (57° F.) contained 719,000 per c.c. after ten hours, and 5,820,000 per c.c. after twenty-four hours. In another case, where the ice-chest was small and the ice rapidly melted (the temperature varied from morning to night from 5° C. to 12° C.), there was a slow increase in the number of micro-organisms. The milk, one hour after milking, contained 6500 micro-organisms per c.c., after four hours in the ice-chest 5000 per c.c., after eight hours 12,500 per c.c., after twenty-four hours 87,700 per c.c., and after forty-eight hours 168,700 per c.c. The same milk, kept at 22° C. (72° F.), contained 25,000 after four hours, 310,000 after eight hours, and more than 11,000,000 after twenty-four hours. The efficacy of refrigeration, therefore, follows the degree to which the temperature is lowered, the increase of the number of organisms being stopped or very greatly retarded.

Their experiments with the addition of peroxide of hydrogen are of great interest. They made three series of experiments at 15° C., 22° C., and 34° C. A sample of milk, one and a half hours after milking, contained 25,000 micro-organisms per c.c., and kept at 15° C. (59° F.), four hours later it contained 175,000 per c.c., six hours later 250,000 per c.c., and twenty-four hours later 2,200,000 per c.c.; while at the same temperature the milk to which 2 per cent. of peroxide water had been added contained only 10,000 per c.c., 500 per c.c., and 2200 per c.c. after the lapse of four, six, and twenty-four hours respectively. Milk (containing 63,000 micro-organisms per c.c.) similarly treated and kept at 34° C. (93° F.), contained after nine hours 20,000 per c.c., and after twenty-four hours 120,000 per c.c., while the untreated milk at corresponding times contained 1,850,000 per c.c., and 60,000,000 per c.c. These results and those of other experiments which the authors made, show fairly the powerful effect of the antiseptic in reducing the number of micro-organisms, but the action is only apparent for from eight to ten hours as a rule. Thereafter the numbers slowly increase. This is quite in accord with the results of the study of the chemical changes which take place in the milk. From their own results and those of M. Renard they are of opinion that the method is an efficient one for the preservation of milk.

As regards the effect on pathogenic organisms, they found that in sterilised milk containing 2 per cent. of the peroxide of hydrogen water, *B. typhosus*, *B. choleræ*, and *B. pyocyaneus* survive, as do also *B. cyanogenes* and *B. prodigiosus*, which are respectively the cause of "blue" and "red" milk. They considered it unnecessary to experiment with B. *tuberculosis*, when these less resistant organisms survived. Hence the addition of peroxide of hydrogen to milk, in quantity sufficient to ensure its preservation, gives no security as to the destruction of pathogenic organisms which it might contain. Nicolle and Duclaux, however, consider that, being a method which does not alter the properties of the milk, it deserves the attention of sanitarians, especially as it is much more easy of application than refrigeration, which also has no effect on the pathogenic organisms which may be contained in the milk.

THE SOPHISTICATION OF FOODS.

IN a paper read before the Incorporated Society of Medical Officers of Health, Dr. J. Spottiswoode Cameron, Medical Officer of Health of Leeds (*Pub. Health*, London, vol. xvi. No. 6), states clearly his views on this subject. Under the term sophistication he includes—(1) The addition to a food of a foreign substance of inferior value, but possessing some resemblance of the food itself, (2) the substitution of an inferior substance for the food itself, (3) the removal of some valuable natural constituent from the food, and (4) the addition to the food, unknown to the purchaser, of a preservative. He considers that the mere addition of salt to a natural food, *e.g.* a leg of pork, unless declared, is of the nature of sophistication. Sold as "pickled pork" it would no longer be a sophistication, but it is questionable whether the substitution of sodium borate for sodium chloride in the pickle would not be really a sophistication. He considers that the presence of the boron compound should be frankly declared, as it is either added because the flavour of pork so treated is preferred by the ordinary consumer, or because borax is more convenient to the pickler. As regards the addition of boric compounds to milk, he points out the risk of the amount of these on ingestion being by no means inconsiderable. First a little boric acid is added at the farm, then a little glacialine (a boron compound) by the middleman, then a little borax by the retailer, and if in a hotel or boarding-house, probably some other boric compound may be added in the kitchen to confer greater keeping quality on the milk.

As regards *simple addition*, he cites the case of coffee and chicory mixtures. The law lays down no limit as to the amount of chicory which may be added to coffee, provided it is stated on the package that "This is sold as a mixture of coffee and chicory." Some indication of the proportions is *absolutely* necessary for the protection of the public, as there is evidently a great temptation to the dishonest trader to very unduly increase the proportion of the cheaper ingredient. Similarly, oatmeal may consist largely of barley meal, arrowroot often contains potato starch, and olive oil is largely adulterated with cotton oil, etc.

Like others, Dr. Cameron finds that it is largely in the poorer districts, and with unfortunate results, that adulterated milk is chiefly disposed of. It seems a prevalent opinion that the addition of separated or skimmed milk, or even water to a rich milk, is a venial offence. In both cases there is increased risk of contamination. While the addition of skimmed or separated milk diminishes the most valuable constituent of new milk, watering diminishes the other nutritive constituents as well.

Absolute substitution of an inferior article, being too easily detected, is not very common, although vinegar frequently consists of acetic acid entirely derived from the distillation of wood. Demerara sugar may consist of beet sugar artificially coloured, and glucose is not infrequently used instead of cane sugar in the manufacture of jams, etc.

As regards the use of preservatives, he agrees in the main with the recommendations of the Departmental Committee upon the use of preservatives and colouring matters in foods, except that in all cases in which a preservative is permitted he would insist on its presence being declared. With this alteration he considers the findings of the committee should be enforced by law. The recommendations referred to are briefly as follows:—(1) That formaldehyde be prohibited entirely, and that salicylic acid be used in not greater amount than 1 gr. to the pound in solids and 1 gr. per pint in liquids, its presence to be in all cases declared; (2) that no preservative or colouring matter be added to milk; (3) that, in cream, only boric compounds be used, and that in quantity not exceeding 0·25 per cent. as boric acid, the amount to be declared; (4) that only boric compounds be permitted in butter and margarine, and not to exceed 0·5 per cent. as boric acid; (5) that no preservative be used in invalids' or infants' foods; and (6) that copper salts be prohibited in preserved foods. Dr. Cameron states that these recommendations have not been without some effect, as magistrates have in many cases looked upon the suggested limits as a sort of standard. Further, he has the promise of certain jam makers to limit the amount of salicylic acid to the maximum suggested, and also to declare its presence upon the label.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Obstetrical Society.—*April* 13, 1904.—Dr. Brewis, President, in the chair.—Dr. Haultain showed—(*a*) Double pyosalpinx with ovarian abscess and hæmatoma; (*b*) a very early complete cast of the uterus with contained ovum; (*c*) full-time fœtus retained forty-one years in the abdomen.—Professor Jardine showed a modification of Braun's hook.—Dr. Fordyce showed—(*a*) A large ovarian tumour with extensive adhesions; (*b*) a large dermoid ovarian cyst.

Communications.—Professor Jardine (Glasgow) read "Clinical Notes of a Series of Twenty-two Cases of Obstructed Labour, including Eight Cases of Induction of Labour, Four Cases of Symphysiotomy, and Ten Cases of Cæsarean Section." He gave details of all the cases, and contrasted the indications for and the results of the three different obstetric operations referred to.—Dr. Fordyce read Dr. Buist's paper on "Some Cases illustrating Thyroid Relations in Obstetrics and Gynæcology.—Dr. Chalmers Watson gave a demonstration of naked-eye and microscopic specimens, illustrating the influence of a pure meat diet on the thyroid and parathyroid glands.

Glasgow Medico-Chirurgical Society.—*April* 1, 1904.—Dr. A. A. Young showed—(*a*) A case of spindle-celled sarcoma of the abdominal wall, of very slow growth, in a woman æt. 38. (*b*) A patient who sustained a dislocation of the left knee-joint two years ago. The patient, a young man, was hit on the lower end of the femur by a sprag from a waggon, while standing with the knee extended. A partial backward dislocation of the lower end of the femur resulted. The dislocation was reduced by flexing the leg, under chloroform. The patient can use the leg freely. Flexion of the knee is not so complete as in the other leg.—Dr. Alex. M'Lennan showed a case of web-fingers in a child. The middle, ring, and little fingers formed a solid mass. The operation performed consisted in making incisions on both palmar and dorsal surfaces in the grooves between the fingers. The subcutaneous tissues on the sides of the fingers were removed down to the bone and the edges of the wound brought together with numerous stitches. Counter-incisions were made in the fingers to diminish tension. The fingers were blanched for about an hour, but gradually the colour returned. A good result has followed.—Dr. G. Bell Todd made a communication on ankylostomiasis, illustrated by lantern slides and specimens. He showed on the screen the ova with the embryo emerging from the capsule, also the larva and the mature male and female. The ova were found in the fæces. The creature passed through its larval stage outside the body, was then conveyed on the hands or food to the mouth and gained entrance to the intestine. The ova required for their development moisture and a temperature of about 80°F. Dr. Todd then described the prophylactic measures employed by mine-owners on the Continent. Pails were placed at regular intervals in the bottom of the mine in which the miners had to defæcate. These pails were taken to the surface, washed and steamed. The miners, after their day's work, took off their working clothes and hung them in a vestiary to dry. They then had a douche bath and put on other clothes. Thymol and extract of male fern were also given internally.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*April* 11, 1904.—MR. A. E. MAYLARD, President, in the chair.—Dr. G. B. BUCHANAN showed a segment of bowel with a Meckle's diverticulum excised for the relief of obstruction. The tip of the diverticulum was not attached, nevertheless it and its mesentery had become twisted in such a manner as to produce a gradual strangulation of the bowel.—Dr. J. R. RIDDELL showed several cases of rodent ulcer, lupus, etc., treated by X-rays and other electro-therapeutic means. Several of the cases were previously shown to the Society (February 1903). The results of the treatment had been most satisfactory.—Dr. A. N. M'GREGOR and Dr. R. RAMSEY gave a demonstration and read notes of experiments undertaken to determine the relative efficiency of dressing materials as absorbents of the discharges from wounds. The most efficient was found to be a cylinder of woodwool, and next to it lint. The favourite packing, iodoform gauze, was found relatively very inefficient; some samples, indeed, were almost waterproof.—Dr. W. W. CHRISTIE (for Dr. WALKER DOWNIE) read notes of two recent cases of crico-thyrotomy for the removal of intra-laryngeal new growths.—Dr. A. R. FERGUSON showed microscopical sections of the tissues removed, and read a pathological report upon them.

FORFARSHIRE MEDICAL ASSOCIATION.—*Friday, April* 8, 1904.—Dr. GRAHAM CAMPBELL, Vice-President, in the chair.—Professor M'EWAN gave notes of a series of abdominal operations.—(1) A case of internal strangulated hernia (gangrenous). The patient, a female, æt. 56, was admitted to the infirmary with a history of five days' vomiting and acute obstruction. The hernia was into the pericæcal pouch. The gangrenous bowel was excised, and an end-to-end anastomosis performed with Murphy's button, owing to the exhausted condition of the patient. The patient's convalescence was uninterrupted. Lantern slides showing the various intraperitoneal pouches were exhibited, and the subject briefly touched on. (2) A case of choledochotomy for gall stones, complicated with ruptured gall bladder. The patient, a male, 35 years of age, had for the past ten years been subject to attacks of biliary colic. A week before admission to the infirmary, he had a severe attack of pain in the epigastrium, accompanied by rigors and later high temperature and delirium. On the night before operation the temperature rose to 106°. A gall stone was removed from the common bile duct, which was then sutured. The patient's condition improved gradually without much trouble and without any fistula resulting. (3) A case of gastrectomy for cancer of the body of the stomach. The patient, a female, æt. 43, was admitted for abdominal pain and with a history of progressing weakness and of discomfort in the abdomen of about four weeks' duration. A movable tumour was made out to the left of the umbilicus. The progress of the case after operation has been good, and the patient was now able to take a very fair quantity of nourishment, five weeks after the operation. (4) A case of laparotomy for intestinal obstruction caused by an adherent appendix.—Dr. **Cochrane Buist** gave some statistical notes on his hospital experience of cœliotomy, anterior and vaginal.

OBITUARY.

◆

Sir Henry Thompson, Bart., F.R.C.S.

Although for some years this venerable and distinguished surgeon had been but little occupied in the active work of his profession, he was nevertheless much before the public as a literary worker, and although he had reached the advanced age of eighty-three, his death has come with something of surprise.

A native of East Anglia, Sir Henry Thompson was born in 1820 of artistic parentage. Prevented by family prejudice from devoting himself as he desired to the medical profession until he was twenty-eight, he became a member of the Royal College of Surgeons in 1850, and a Fellow in 1853. Three years later he was appointed Assistant-Surgeon to University College Hospital, with which he remained in active connection till 1877, when he became Consulting Surgeon. In his own department of surgery, he held the foremost place for many years, and had as patients many of the most celebrated men of the day. He contributed largely to the literature of his specialty, as well as to other branches of surgery. One of the most versatile and many-sided men in the medical profession, inheriting strong artistic leanings, he devoted much of his leisure to sketching, and for a time seriously studied the work of the brush under Elmore and Alma Tadema. He exhibited at the Royal Academy and the Paris Salon, surely an uncommon feat for a surgeon. In literature he made two essays in the field of fiction, both of which were successful. As a collector, as an astronomer, as a cyclist, and as a motorist, he figured to a considerable extent.

But outside of his professional relations he was chiefly known for the important part which he played in advocating cremation, and for his theoretical views on dietetics and his social exposition of them. He founded and presided over the Cremation Society, and largely popularised this method of disposal of the dead. In the field of dietetics, again, Sir Henry Thompson was well known, and works which he wrote upon this subject have gone through many editions. Few men of his time, and certainly no medical man of the age, has had such a wide circle of acquaintance amongst the literary and artistic classes in England. By his death the medical profession has lost one of its most distinguished members. To his contemporaries he was one of the most stimulating of their associates, and to the younger generation he furnished one of the brightest examples of successful work.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

The Cancer Problem.

THE increased attention to the cancer problem now being given by research workers in this and other countries, has stimulated both lay and professional hope that some effectual means of combating this dread disease will ere long be discovered. This country has taken a lead, under the stimulating influence of the King, in encouraging this research, and it is naturally gratifying to us that the new facts which have been its first-fruits are largely due to British workers, namely, Farmer and his collaborators (Moore, Digby, and Walker), Bashford, and Murray.

The heterotype character of the mitosis of some of the cells in malignant growths, both of man and animals, is the leading feature of these new facts. In giving to the British workers the credit for this discovery, the extensive researches of von Hansemann on the phenomena of cell division in cancer in man must not be forgotten. They are most valuable; and though he did not arrive at the full truth, he showed that the mitoses in cancer cells differed in certain respects from those of normal tissues. Also in one other aspect of the problem, namely, the transmissibility of cancer from one animal to another, important advances have been lately made by two continental workers, Borrel of Paris and Jensen of Copenhagen. Their results have been fully corroborated in this country by Bashford and Murray, who have also shown, what has hitherto been imperfectly understood, that cancer occurs widely among the lower animals. The facts at present before us, valuable as they undoubtedly are, are still too bald to allow us to see clearly their full significance, and to entitle us to draw from them more than very tentative deductions. Any attempt in this direction is bound to be very imperfect, but it may serve to help those who have not time to study the problem for themselves to obtain a clearer view of the possibilities suggested, and also prevent them from building their hopes too high, a common tendency when, as in the present case, the general interest and aspirations are so great. A study of the results of Borrel and of Jensen, the latter particularly, prepares the way, in part at any rate, for a better appreciation of the work of the British workers. They both succeeded in transmitting a cancerous tumour, found naturally in a mouse, to other mice of the same species, in no fewer than nineteen generations of white mice in Jensen's experiments. He kindly supplied a piece of one of his experimental tumours to Bashford and Murray, who were equally successful in transmitting the disease to other white and grey mice, so that over 1800 such transmissions have been accomplished in Copenhagen and London together by the end of March of the present year. Transplantation to other animals of a different kind was not successful. The tumour shows microscopically the structure of an epithelioma, and causes ultimately the death of the mouse, following either upon cachexia or ulceration of the skin. Certain characters of the tumour seem worthy of special mention. These are its vigour of growth, its resistance to destruction, and its failure to produce metastases. Its power of growth is great, as it usually increases steadily from its first appearance at the seat of implantation until it may equal in size the mouse itself. Jensen tested the powers of resistance possessed by its cells, under varying conditions, when isolated from the body but kept moist in a sterile fluid. They remained alive for about eighteen days at a temperature of about 1° to 3° C., for about twelve days at room temperatures, but only for twenty-four hours or less at the body temperature. Normal physiological cells do not possess resisting powers so high as these. Experimental transplantation of such tissues, particularly of testis and ovary, has been frequently made, always with a negative result. Transplantation of chorion at different periods of its development has similarly failed. But it is to be noted that, notwithstanding the possession by the cancer cells of powers of such high vitality, the inoculation of white mice did not succeed in more than 30 to 60 per cent. of Jensen's cases. The tissues of the ordinary healthy animal overcame and destroyed the implanted cancer cells in about half of the *a priori* equally susceptible cases experimented upon. Certain other malignant new growths, occurring naturally in mice and other animals, when transplanted to healthy animals of the same species, failed to grow (Borrel, Jensen, The Cancer Research Committee). Moreover, in successful cases, only a very few of the cancer cells implanted survived, and the tumour was wholly the result of their multiplication, the tissues of the mouse taking no part in the process. This repeats what occurs in metastases in the human subject, the new growths being always the products exclusively of the invading cancer cells. It is even probable that here also many of the invading cells perish, but of that we have no certain knowledge. The successful cells must possess powers both of offence and defence which normal physiological cells do not possess, and which apparently many of the cells of a cancer itself do not possess.

These powers, or some of them, are lost when tumour tissue is broken down into an emulsion containing no intact cancer cells. Inoculation with such an emulsion failed. The nature of these powers is at present unknown to us, and the discovery of Farmer and his collaborators of the existence of heterotype mitosis in cancer cells is an important addition to our knowledge, and may have a valuable bearing upon the solution of this question. We are not yet in a position to gauge this in its entirety, but the interpretation suggested by Farmer is as scientific as it is fascinating. So many observers have corroborated Van Beneden's epoch-making discovery, that the nuclei of the conjugating germ cells contain each one half the number of chromosomes possessed by the body cells, that it may probably be regarded as a universal law of development. It had not been observed in other cells until Farmer's discovery of it in cancer cells. Moreover, the other differences in the behaviour of the chromosomes of cancer cells, besides this reduction in number, are similar to those which occur in conjugating germ cells. Hence the deduction, that some of the cells of a cancer are, if not actually germ cells, homologous thereto, is a natural one, though it does not necessarily follow. The essential fact of fertilisation and sexual reproduction is a union of equivalent nuclei, and though in the higher plants and animals the conjugating cells differ widely morphologically and physiologically from one another, yet in the lowest forms they cannot be distinguished morphologically from one another. Further, in the maturation of the ovum, three small cells (polar bodies) are produced and extruded before its nucleus is ready for union with the sperm nucleus, but in the maturation of the parthenogenetic egg, the rôle of the spermatozoon appears to be played by the second polar body. Now, actual conjugation of resting nuclei in an epithelioma has been observed by Bashford and Murray. The tumour showing it was preserved eight days after transplantation. Out of a large number of tumours of the same series, another was obtained seven weeks thereafter, which showed identical conjugation figures. It is too early yet to say what this means. It may point to actual conjugation at rare intervals, with parthenogenetic fertilisation between, or to other possibilities, but enough has been said to show that fertilisation may possibly occur in the cells of a cancer, and this theory is further supported by many of the cells exhibiting not the heterotype mitosis characteristic of germ cells, but the ordinary form characteristic of their descendants the ordinary body cells. Bashford and Murray's results still further suggest that fertilisation may be the explanation of the remarkable proliferative powers of cancer cells, for they found that "among the sixty-nine mice which had received portions of the tumour showing conjugation and rapid growth, there were thirty-four rapidly growing tumours; in the other series, which had received portions of the slow growing tumour in which conjugation was not observed, only three minute tumours were detected in the forty-seven mice."

Notwithstanding all this support, however, it would be rash to accept this theory as anything more than a very tentative one. We do not yet know the precise part played by the chromosomes of the nucleus in the action of fertilisation. Further, if fertilisation is the explanation of the excessive vigour possessed by cancer cells, should we not expect to find heterotype mitosis in the early cells of a cancer? But Bashford and Murray, who have had exceptionally favourable opportunities of testing this very point, having examined over 1800 transplanted tumours at all stages, did not find them.

It will be remembered that every new tumour which developed arose entirely from the actual cells introduced. Only a few of these cells survived, and the tumour was the result of their multiplication, but in the earliest stages of these multiplications Bashford and Murray found no mitosis whatever. They did not appear until later, and they showed not the heterotype, but the ordinary form characteristic of the body cells. Further, in all cancers and sarcomas from every source, whether primary or secondary, examined by them, the cells at the growing margins showed the same somatic form of mitosis. The number of heterotype mitoses, moreover, varies greatly in different tumours and in the descendants of one and the same tumour at different ages. It is often small where rapid cell division is taking place; in short, the number of heterotype mitoses bears no relation to the degree of malignancy. It is thus obvious that we must wait for further light before we can come to any stable conclusions. The discoveries are none the less striking, and will stimulate fresh research in many quarters. Whatever may prove to be the true significance of heterotype mitosis, if it be always present, as appears to be the case, in malignant but never in simple tumours, one immediately useful result may be found, in the direction of the differentiation of simple from malignant growths, by the determination of the type of mitosis present in their cells. That it will be generally useful is hardly to be hoped, as it necessitates more careful fixation of specimens than is always given to tumours sent to laboratories for diagnosis, but it ought to be of assistance in competent hands. Solid and papillomatous cystic tumours of the ovary may be cited as an illustration. All the evidence, clinical as well as histological, hitherto available is often insufficient to enable a diagnosis between benignancy and malignancy to be made. Perhaps the character of the mitosis may now enable us to do this.

The Royal Army Medical Corps and Lord Esher.

THE report, just published, of the War Office (Reconstitution) Committee makes but poor reading for those who have the welfare of the army at heart. Great hopes have been entertained ever since the names of those who had consented to serve on that committee were discovered; those names were a sufficient guarantee that the vast reference, a reference which aimed at nothing less than the complete reconstitution of the justly discredited War Office, would be carefully and faithfully fulfilled. It would appear as if the task were too great for even the great triumvirate that essayed it. The general impression produced on reading the report is an effect as of "sketchiness," so to speak, of a rather nebulous appeal to first principles. As a single instance of what is meant, take this pronouncement on the subject of finance: "Large economies can only be effected by—(*a*) The adoption of sound policy at the initial stage; or (*sic*) (*b*) The exercise of special care in the actual disbursement." Both suggestions are obvious to the verge of platitude; why they should be stated as alternative, passes comprehension. Further, there is a certain fragmentary and patchwork arrangement of many of the subordinate details, which bids fair to render their actual working out a matter probably of great complexity. This is particularly well seen with regard to the position of the Medical service. Every one is aware of the condition of that important department, how seriously it has been undermanned whilst on a peace footing, how many and grievous have been the disabilities under which its officers worked, how widespread the discontent within and the dissatisfaction without; from all of which we had hoped that the establishment by Mr. Brodrick of the Director-General of Army Medical Services upon the War Office Council would have delivered us. That hope is not, apparently, to be realised. The new Army Council is going to do without any direct representative of the Army Medical Services. These are to be represented by a subordinate official who shall report to one of the military members of that Council. The reason for making this reactionary step is given, and does not appear on the face of it to be a very cogent one. "It has been represented to us that a place on the Army Council ought to have been provided for the Director-General of Army Medical Services. . . . We cannot accept that view. The Army Council is not, and cannot be, a representative body as regards the several arms and departments. The Royal Army Medical Corps exists to serve the army in a most important capacity; but the first object must be to create and to maintain an army, and this is the function of the Army Council. To admit the principle of representation would destroy the character of the Council." Now, while it may be true that direct representation of each arm would be out of place, it is quite evident that in practice the military, fighting, branches of the service will be very directly represented by the three military members, who cannot fail, amongst them, to give voice very clearly to the actual needs of the different arms. This also may be said, that each is capable, by reason of his presumed military training, of gauging quite accurately the value of any measures which may be under consideration. Thus the fighting branches will of a certainty be directly represented, and the questions relating to these will receive careful and competent consideration. But the Medical "arm" will be at a double disadvantage. It is not to have the same direct representation, and the questions affecting it are to be discussed and settled by a body quite ignorant of science, or with just the little tincture of knowledge which is proverbially so dangerous. There is absolute and clamant need for the presence within this powerful authority, of some one who shall advise it on the many points which are sure to arise constantly, and the importance of which, for the well-being of the army, cannot be overestimated. Indeed, the committee must have seen very clearly the likelihood, nay the certainty, of such a position; for in Sec. I., para. 13, they make the very important suggestion, that "the Director-General, if necessary, associated with a civil representative of the Army Medical Advisory Board, should be summoned to the Council whenever his advice and specialist knowledge are required." And which of these officials, necessarily ignorant of medical science, is to say when that is to be? It is not as if the Army and the Army Medical Service were two distinct entities. They overlap at a hundred different points; and while medicine can do without the army, the army cannot do without medicine. It moves on its belly, as is proverbial, and if that organ be not in good condition where is then the army? The retrograde nature of the proposal cannot be too strongly insisted upon. If the Director-General be placed in a position subordinate to the third military member, we shall have lost all that has been gained under the Brodrick *régime*, and the loss will be immense, not to the Medical service alone, but to the army as a whole. But, to make matters worse, let it be noticed that the Director-General is to be placed under an official who is destined to live only the life of a dog at any rate! The Adjutant-General, unlucky man, has under him two highly explosive forces, the Army Medical Service and the Auxiliary Forces! His expectation of life must necessarily be brief. With the latter force we do not deal directly here, although it too has its medical officers. But the strongest advocate of the Volunteer movement will not assert that that body takes anything "lying down," and the third military member will have enough on his hands with it, without anything else. We wish him well!

As another instance of the "sketchy" nature of the report, we must note, as others have done, the emergence of a new organism, the "Army Hospitals Committee." One might suppose that this body would be in touch, by some means, with the Director-General, and through him with the Adjutant-General, his chief. Nothing of the kind. This "important committee" is placed under the Civil member of the Board, reporting to him *viâ* the Director of Barrack construction. Whence this Committee derives its existence remains a mystery. All we are told about it is that it is formed to undertake, "among other duties," that of reporting upon all plans for new hospitals, and standard plans for barracks and standing camps, and selecting sites for new hospitals. As for the Director-General of the Army Medical Services, it may apparently disregard him entirely!

One very sound suggestion, however, has been made in the report. It is that the Intelligence Department should include within it an officer of the Royal Army Medical Corps, whose business it shall be to supply the Director-General with information regarding new developments of military hygiene, and who shall be enabled to travel for this purpose when necessary. This is a suggestion which, if properly carried out, should be of the greatest value to the army. Would that all the Committee's suggestions were of the same practical value!

Scientific Composition. THE distinguished Professor of Physic in the University of Cambridge is always interesting, whatever his subject may be. He is, moreover, a master of style, whether he is occupied with literary or scientific matters. It is, therefore, with no ordinary pleasure that we have read the *Notes on the Composition of Scientific Papers,*[1] which he has been led to write in consequence of his dire experience in thesis reading. Dr. Clifford Allbutt advances cogent reasons for the production of this book. "The matter of these theses is good," he says, "it is often excellent; in composition a few are good, but the greater number are written badly, some very ill indeed. The prevailing defect of their composition is not mere inelegance; were it so, it were unworthy of educated men. It is such as to obscure, to perplex, and even to hide or to travesty, the sense itself." "The use of thesis-writing is to train the mind, or to prove that the mind has been trained; the former purpose is, I trust, promoted, the evidences of the latter are scanty and occasional." These extracts from the preface will give some conception of the intention of the Professor's book.

There is, in truth, much need for such a work as this, since medical writing is often extremely thin in matter and bald in manner. It is to be hoped, nevertheless, that the following sentence, culled by the author from a Cambridge thesis, is indeed, as he says, a record:—"Then *I* should advise putting

---

[1] London: Macmillan & Co. Ltd., 1904.

your feet into hot water, when *he* will feel a gentle perspiration breaking out, and next morning *one* will feel the cold passing off." Such an incoherent statement can only be equalled by the inconsequent request of the little vagrant, who begged from a Scottish farmer's wife in the following terms:—"Wull ye gie's a drink o' watter, for I'm that hungry I dinna ken whaur I'll sleep the nicht." Such an example as that given by the author is, it might be thought, not often to be met with, even in the hurry of ephemeral medical literature. Yet instances of thoughtless writing, leading to the most perplexing results, often come before our notice. The following paragraph, extracted from a grave and solid treatise, may serve as an instance of what is probably the high-water mark of careless composition:—"Cases of this sort are not uncommon, the diagnosis remaining uncertain to the end; and, during life, it remains a question whether the patient died simply from the effects of repeated hæmorrhage, or whether the condition was really one of pernicious anæmia from the beginning, the fatal issue being merely hastened by the hæmorrhages." Easy writing, as is well known, makes hard reading.

Dr. Clifford Allbutt's work is divided into two parts: an introductory section upon the form and purpose of academic essays, in which there are many amusing examples of formalism, gaudiness, slang, and other defects, and a longer portion devoted to the art of scientific composition, containing useful suggestions on the construction of good sentences, and valuable hints on what is to be avoided. In this second part of the book there are many excellent remarks on weakness of verb and exuberance of adjective, as well as on meagreness of vocabulary and misuse of phraseology. In warmly thanking the learned author for the service he has rendered contemporary science by the publication of this work, we desire, at the same time, to take the opportunity of recommending every medical author to read it. No one can rise from its perusal without an uncomfortable feeling that perhaps he may from time to time have been guilty of some of the absurdities which are pointed out in the volume.

ORIGINAL COMMUNICATIONS.

A COMPARATIVE STUDY OF THE BACILLI OF DYSENTERY.

By J. W. H. Eyre, M.D., F.R.S. Edin., *Lecturer on Bacteriology in the Guy's Medical and Dental Schools.*

(*From the Bacteriological Laboratories of Guy's Hospital.*)

The observations of Kruse in Germany, and of Vedder and Duval in America, have recently given a powerful impetus to the study of that form of dysentery occurring in asylums (and frequently masked under such names as membranous or ulcerative colitis, less frequently referred to as asylum dysentery) by bacteriological methods; and early in 1902, at the suggestion of Dr. Mott, some work was undertaken by the late Dr. Washbourn, C.M.G., and the present writer, on the subject of the agglutinins present in the blood of patients suffering from this disease.

At first we limited our observations to testing the serum against an alleged *Bacillus dysenteriæ*, kindly supplied to us by Dr. Mott, and to a comparison of the results obtained with those noted when the serum was tested against other members of the coli group—including *B. typhosus* and *B. enteritidis* of Gärtner—intending at a later period to extend our investigations to a study of the bacilli occurring in the lesions characteristic of the disease. Soon, however, the anomalous results obtained by other observers with this serum reaction raised the suspicion that many of the strains of bacilli employed in different laboratories, and all assumed to be identical with that originally described by Shiga as the specific organism of tropical dysentery as met with in Japan, differed in many essential points not only from the originally described *B. dysenteriæ*, but also from each other. A comparison of as many of these strains as could be obtained was therefore undertaken, and the results are given in the following pages. And here the writer wishes to express his indebtedness to Dr. Mott, Professor Welch, Professor Kolle, Professor Flexner, and others, who so kindly supplied suggestions and material for the work. The strains examined number ten in all, commencing with the first five enumerated below; additional specimens were then added as opportunity offered, and complete parallel sets of subcultivations prepared from all the original cultivations. These were critically examined and compared at various ages, and the descriptions compiled after a careful consideration of all the individual notes.

Part I.

In these comparative tests accurately standardised nutrient media were employed, and a sufficient quantity of each medium was prepared to enable one to carry out all the subcultivations needed for each set of observations. Solid and fluid media, where possible, were accurately standardised to +10 (Eyre's scale).

Strains of Bacilli studied and compared: B. Dysenteriæ.

Mott, No. I.—Isolated from the gall bladder of a patient suffering from asylum dysentery; Claybury Asylum, England.

Flexner, No. II.—"Strong" type; isolated from the stools of a case of tropical dysentery; Philippine Islands.

Flexner, No. III.—"Duval" type; isolated from the stools of cases of infantile summer diarrhœa; Baltimore, United States of America.

Flexner, No. IV.—"New Haven" type; isolated from the stools of cases met with during an epidemic of asylum dysentery; New Haven, United States of America.

Flexner, No. V.—"Harris" type; isolated from the stools of cases of acute tropical dysentery; Manilla.

Shiga, No. VI.—Isolated from the stools of cases of epidemic dysentery; Japan.

Shiga, No. VII.—As No. VI., obtained from Kral's Laboratory; Prague.

Shiga, No. VIII.—As No. VI., but obtained *vià* Berlin.

Kruse, No. IX.—Isolated from the stools of cases of epidemic dysentery; Laar, Germany.

Eyre, No. X.—"S. H." type; isolated by the writer from the stools of several cases of epidemic asylum dysentery in England.[1]

Other Bacilli of the Coli and Typhoid Groups.

It will be convenient to refer here to the source of the following well-known members of the *Coli* group, which were chosen in order to serve as controls in this investigation, on account of their close relationship in character and habitat.

B. coli communis (Human type).—Isolated from a scrotal abscess.

B. coli communis (Water type).—Isolated from contaminated water supply.

B. typhosus (Nos. 6, 9, and 10).—Isolated from the spleens of fatal cases of enteric fever in the wards of Guy's Hospital.

B. enteritidis (of Gärtner).—Isolated from the stools of an acute case of gastro-enteritis; Colney Hatch Asylum.

All these ten strains of *B. dysenteriæ* showed the following points of similarity:—

Morphology, etc.

1. *Morphology.*—Short rods with rounded ends, of varying lengths, generally occurring singly, but sometimes arranged in pairs, end to end; individuals measuring from 1 to 3 μ in length by about 0·5 μ in diameter, and but rarely forming threads. In old cultivations involution forms are common.

2. *Motility.*—Active Brownian movement but no true locomotion.

---

[1] *Brit. Med. Journ.*, 1904, vol. i. p. 1002–4.

After prolonged cultivation in the laboratory, all the strains show less active Brownian movement.

3. *Spores.*—None are formed.

4. *Capsule.*—Never observed either in body fluids or in artificial cultures.

5. *Flagella.*—None could be demonstrated, although all the standard methods, Van Ermengen, Löffler, Pitfield, Muir-Pitfield, etc., were repeatedly tried.

6. *Staining.*—Good and even with all the aniline dyes when the cultures are young; the individual elements present in cultures of more than 48 hours exhibit irregular staining—sometimes polar. The stain is never retained after treatment by Gram's method, nor are the bacilli either acid or alcohol-fast.

7. *Temperature.*—Optimum, 37° C. Growth good but less rapid and less luxuriant at 18° to 22° C. Growth also good at 40° C. and 42° C., but ceases at 45° C.

8. *Atmosphere.*—Good growth anaërobically, though perhaps less luxuriant than that obtained aerobically.

Cultural Characters.

1. *Gelatin plates.*—Surface colonies at 48 *hours*—1 to 2 mm. diameter, round, effused, smooth, reticulate, with entire margins, pearl-grey in colour and translucent, and closely resembling those of *B. typhosus.* 3 *to* 6 *days*—The colonies are larger, 4 to 6 mm. diameter, darker, thicker, and slightly elevated in the centre, coarsely granular. At the periphery is a clear transparent zone; the edge is lobulated. No liquefaction of the medium occurs.

2. *Gelatin stab.*—24 *hours*—No apparent change. 48 *hours*—Scanty white filiform or beaded growth along whole length of stab. There is also a slight flat growth on surface at point of entrance of needle, but no liquefaction.

3. *Gelatin streak.*—24 *hours*—Very slight, almost transparent, moist, glistening growth along lower half of streak, especially marked towards the bottom. 48 *hours*—Growth increased, resembling "white of egg," and slightly raised. Many discrete colonies along the edges. Spreads gradually in a lateral direction, getting more opaque, with slightly lobulate edge. At no time shows any liquefaction.

4. *Gelatin shake.*—24 *hours*—No apparent change. 48 *hours*—Slight turbidity, due to numerous minute colonies, which, although present in the depths, are larger and more closely packed near the surface of the gelatin. No gas formation.

5. *Glucose formate gelatin shake.*—24 *hours*—Very faint haze. 4 *days*—General haze at top, minute colonies in substance; slight, dry, granular growth on surface. No gas formation takes place.

6. *Agar plates.*—Surface colonies, 24 *hours*—2 to 4 mm. diameter, round, pulvinate, smooth surface, entire edge, moist, glistening, porcelanous. Under the low power (¼ in.) the refraction is weak; the central part of the colony—the nucleus—is darker, pale yellow to buff and coarsely granular; the periphery lighter, finely granular, colourless and transparent; the edge is undulate. 48 *hours*—Colonies average 5 or 6 mm. in diameter; macroscopically, beyond being distinctly

whiter, they present no marked differences from those seen at 24 hours. Microscopically, the nucleus is more distinctly marked, oval with lobulate outline, brownish in colour and very coarsely granular; this is surrounded by a grumose zone, whilst at the periphery of the colony a very narrow clear zone can be made out extending to the edge. 6 *days*—Colonies are but very little larger than at 48 hours, still more or less round with undulate edge, raised and slightly umbonate. They are also less moist, whiter and more opaque. Microscopically, the whole colony is coarsely grumose, and a deeper brown by transmitted light; towards the periphery the clustered particles are more scattered, and a very narrow band of coarse granules is left at the margin of the colony. Deep colonies, 24 *hours*—Lenticular or irregularly spherical in shape, entire edge finely granular, dirty yellow in colour. 3 *days*—Shape roughly spherical, margin lobulated, surface coarsely granular, colour deep brown.

7. *Agar streak.*—24 *hours*—Thin, flat, but well marked shining translucent growth along the line of inoculation, dull greyish white in colour, with entire margins. 6 *days*—Raised, smooth, moist, opaque white growth with undulate edge more marked at the lower part where the growth has spread out somewhat; often showing a central depressed streak which marks the site of inoculation. Successive subcultivations show increasingly luxuriant growth, which is whiter and more opaque than early subcultures.

8. *Blood agar.*—24 *hours*—Raised, moist, glistening growth, with spreading lobulate edge. The growth is more profuse, the centre more raised, and the edge more transparent than on agar.

9. *Neutral red glucose agar shake.*—24 *hours*—Growth can be observed in the form of small spherical colonies, but the colour is unaltered, and no gas is formed. 6 *days*—No further change.

10. *Blood serum streak.*—As on agar.

11. *Broth.*—24 *hours*—Very slight turbidity. 48 *hours*—Good general turbidity, slight deposit. 3 *days*—Marked turbidity, with small, dirty-white deposit which gradually increases in amount while the supernatant broth becomes a little clearer. At the end of two to three weeks the supernatant fluid may be quite clear. At no time is there any growth on the surface in the form of a pellicle.

12. *Anaërobic growth in glucose formate broth.*—24 *hours*—Flaky or granular growth, no gas. Later growth slightly increased in amount, with formation of deposit.

13. *Nitrate broth.*—4 *days*—Good growth. Nitrates present.

14. *Lead broth.*—Good growth. No sulphuretted hydrogen formed.

15. *Potato.*—24 *hours*—Moist, raised, dirty, brownish white growth, which spreads slightly, becomes more elevated and gets more moist until the fifth or sixth day, when it tends to run. Concurrently the growth becomes of a warmer pinkish or reddish brown. Later still the growth becomes dry.

16. *Bile salt solution.*—All strains grow well in this medium anaërobically at 42° C., but differ somewhat in the amount of acidity each produces.

The following points of difference were then established:—

No. I.—24 *hours*—Strongly acid, with no gas. 17 *days*—Strongly acid, with no gas.

No. II.-X.—24 *hours*—Slightly acid, with no gas. 17 *days* —Slightly acid, with no gas.

17. *Indol production.*—In testing for the production of indol, cultures in Dunham's peptone solution were prepared and examined on second, fourth, and seventh days by the "ring" or "contact" test (with pure concentrated sulphuric acid and dilute solution of sodium nitrate), the observation being made immediately and at the expiration of two hours after the addition of the reagents.

The result of the test was as follows:—

Nos. I. and III. gave evidence of the formation of a fair amount of indol.

No. V. gave trace of indol.

Nos. II., IV., VI., VII., VIII., IX., X.—No evidence of indol formation, even after three weeks' growth.

18. *Litmus milk.*—Free growth takes place in litmus milk with all strains, but No. I. differed from the remainder in its action upon this medium.

No. I.—24 *hours*—Acid reaction, no clot. 6 *days*—Acid reaction, soft clot. 7 *days*—Acid reaction, firm clot.

Nos. II.-X.—24 *hours*—Very faintly acid reaction, no clot. 3 *days*—Faintly alkaline—no clot. 4 *days*—More distinctly alkaline, no clot. 7 *days*—Markedly alkaline, no clot.

19. *Fermentative activities.*—The fermentative activity of each of these bacilli was tested on the following selected representative compounds:—

Monosaccharids—Dextrose, Galactose.
Disaccharids—Maltose, Lactose, Saccharose.
Alcohols—Glycerin, Mannite.
Starches—Dextrin, Innulin.

Each of these substances was dissolved in the proportion of 1 per cent. in distilled water. Witte's peptone, 2 per cent., was added to the solution, which was then tinted with 13 per cent. of Kahlbaum's litmus solution, and the medium thus prepared, tubed and sterilised. The *titre* of these various solutions was exactly estimated, and was found to range from $+3{\cdot}3$ (Eyre's scale) in the case of the glycerin solution, to $+15$ in the case of the dextrin solution. A set of tubes representing each of these compounds was inoculated with each of the strains of bacilli under observation, and incubated at 37° C., in company with a set of uninoculated "control" tubes, and examined from day to day up to the end of one week. The result of the experiments may be briefly stated thus:—

All strains.—Nos. I.-X.—Ferment the monosaccharids—dextrose and galactose; and in addition—

No. I.—Ferments the disaccharids—maltose and lactose; and the alcohols—mannite and glycerin and the starch-dextrin.

Nos. II. and III.—Ferment the alcohol mannite.
No. V.—Ferments the disaccharids—maltose and saccharose; and the alcohol—mannite and the starch-dextrin.

Cultivations of all these different strains have now been under cultivation for considerably over a year, the first six, indeed, for nearly two years, and all these dissimilarities have persisted unchanged either in kind or degree during the whole of this period.

To facilitate reference, an analytical comparison of the behaviour of these various strains when grown on different media, together with some others of their more important characters, is set out in Tables I. and II. (*q.v.*); the corresponding reactions of three other types of intestinal bacteria—the *B. coli*, *B. typhosus*, and *B. enteritidis* (of Gärtner), which served the purpose of controls throughout the observations—are also given in the same tables.

From a consideration of the results thus tabulated, it is obvious that strain No. 1 (Mott) is a slightly typical *B. coli*, and as such can be disregarded. Of the remaining micro-organisms, strain IV., VI., VII., VIII., IX., and X. form a group whose members are exactly comparable with *B. dysenteriæ*, as originally described; whilst strains II., III., and V. are varieties so far "fixed" in their characters as to appear to warrant their inclusion in a definite group, distinct from that containing Shiga's *B. dysenteriæ*—a group to which some observers have applied the unfortunate title of "pseudo-dysentery" group of bacilli. I say "unfortunate" advisedly, for many considerations lead me to believe that these two groups are even more closely related than their serum reactions (*vide* Part IV.) would seem to indicate; and the frequency with which members of this "pseudo" group are associated with Shiga's bacillus, at any rate in the Asylum dysentery of England, although absent from the normal intestinal tract, incline me to the opinion that the last word has yet to be said with regard to the etiology of epidemic dysentery.

PART II.

Whilst the earlier part of this work was in progress, the attention of the writer was directed to the recently introduced Drigalski - Conradi medium (litmus - lactose - nutrose agar), particularly with regard to its value in the isolation of *B. typhosus*, *B. dysenteriæ*, and allied organisms, from specimens of fæces. After a considerable amount of work, during which the various factors that give this medium its special characters were carefully investigated, it was found that the medium could be quickly and easily prepared and also accurately standardised, and, when thus prepared, gave good and consistent results.

(The methods of manufacture and standardisation formed the

[*Continued on page* 497.

TABLE I.—*Morphology and Cultural Characters of Dysentery Bacilli.*

Micro-organism.	Morphology.	Motility.	Spores.	Flagella.	Odour of Spermin in Agar Cultivations.	Nutrient Broth (Uniform Turbidity).	Glucose Formate Broth (Anaërobic Growth).	Bile Salt Peptone Solution.		Peptone Salt Solution.	Nitrate Broth (Presence of Nitrates).	Lead Broth (Presence of Sulphuretted Hydrogen).	Litmus Milk.			Potato.	Proskauer and Capaldi.		
								Reaction.	Gas.	Indol within 7 days.	Within 7 days.	Within 7 days.	Reaction at 24 hrs.	Reaction at 7 days.	Clot within 7 days.	Colour of Growth.	No. 1.	No. 2.	
																	Growth.	Growth.	React.
No. I.	Short rods with rounded ends.	Brownian.	—	Average, 2–3	—	+	+	+	—	+	+	—	+	+	+	Deep fawn.	0	+	+
„ II.	„	„	—	—	±	+	+	+	—	—	+	—	±	—	—	Reddish brown.	0	+	+
„ III.	„	„	—	—	—	+	+	±	—	+	+	—	±	—	—	„	0	+	+
„ IV.	„	„	—	—	+	+	+	±	—	—	+	—	±	—	—	„	0	+	±
„ V.	„	„	—	—	—	+	+	±	—	±	+	—	±	—	—	„	0	+	0
„ VI.	„	„	—	—	+	+	+	±	—	—	+	—	±	—	—	„	0	+	0
„ VII.	„	„	—	—	+	+	+	±	—	—	+	—	±	—	—	„	0	+	0
„ VIII.	„	„	—	—	+	+	+	±	—	—	+	—	±	—	—	„	0	+	0
„ IX.	„	„	—	—	+	+	+	±	—	—	+	—	±	—	—	„	0	+	0
„ X.	„	„	—	—	+	+	+	±	—	—	+	—	±	—	—	„	0	+	0
B. coli.	„	Locomotive. ±	—	2–8	—	+	+	+	+	+	+	+	+	+	+	Yellowish brown.	+ +	+	0
B. enteritidis.	„	+	—	8–12	—	+	+	+	+	—	+	+	0	—	—	Dirty buff.	0	+	0
B. typhosus.	„	+	—	8–16	—	+	+	±	—	—	+	+	+	+	—	White moist invisible.	0	+	+

The sign + indicates a marked positive result or an acid reaction.
„ — „ a negative result or an alkaline reaction.
„ ± „ a partial result or a faintly acid reaction.
„ 0 „ no growth or unaltered reaction.

TABLE II.—*Fermentative Activities.*

Strain.	Monosaccharids.				Disaccharids.						Alcohols.				Starches.			
	(+ 4)* Dextrose.		(+ 6) Galactose.		(+ 4·6) Maltose.		(+ 4) Lactose.		(+ 4·4) Saccharose.		(+ 3·32) Glycerin.		(+ 4) Mannite.		(+ 15) Dextrin.		(+ 10) Innulin.	
	Reaction.	Gas.	Reaction.	Gas.	Reaction.	Gas.	Reaction.	Gas.	Reaction.	Gas.	Reaction.	Gas.	Reaction.	Gas.	Reaction.	Gas.	Reaction.	Gas.
No. I. .	+	−	+	−	+	−	+	−	−	−	+	−	+	−	+	−	−	−
,, II. .	+	−	+	−	−	−	−	−	−	−	−	−	±	−	−	−	−	−
,, III. .	+	−	+	−	−	−	−	−	−	−	−	−	+	−	−	−	−	−
,, IV. .	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
,, V. .	+	−	+	−	+	−	−	−	+	−	−	−	+	−	+	−	−	−
,, VI. .	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
,, VII. .	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
,, VIII. .	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
,, IX. .	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
,, X. .	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
B. coli (water)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	−	−
,, (human)	+	+	+	+	+	+	+	+	−	−	+	−	+	+	+	−	−	−
B. enteritidis	+	+	+	+	+	+	−	−	−	−	±	−	+	−	+	+	−	−
B. typhosus.	+	−	+	−	+	−	−	−	−	−	−	−	+	−	+	−	−	−

The sign + = acid reaction or positive gas production.
,, − = unaltered reaction or negative gas production.
,, ± = indefinite or faintly acid reaction.

* *Note.*—The figures in brackets indicate the *titre* of the medium over which it is placed.

subject of a communication to the Pathological Society of London on 19th January 1904.[1])

The next point arising out of this work was to determine whether the chief members of the *coli* and allied groups, when grown as discrete colonies on the surface of this medium (which will be referred to as nutrose agar), presented differential characters which could be relied upon for their recognition, and would facilitate the work of isolation.

Plates were therefore poured, allowed to set, and the superfluous moisture evaporated off by preliminary heating in an incubator at 42° C. for some two or three hours, the medium at the end of this time presenting a firm, dry surface. Broth cultivations of all these various bacilli, *B. coli* (several strains), *B. dysenteriæ* (Strains IV., VI., VII., VIII., IX., and X.), *B. typhosus* (several strains), *B. lactis aerogenes* (several strains), and *B. enteritidis* of Gärtner (several strains), were prepared, and after eighteen hours' growth at 37° C., small quantities of the culture were employed to inseminate the surface of nutrose agar plates, "in series," in sets of three, by means of the angled glass rod recommended for the purpose by Drigalski and Conradi. The plates were then incubated at 37° C., and examined carefully both macroscopically and microscopically at the end of twenty-four and forty-eight hours, and also after seven days' incubation.

Colour.—The most striking feature of the resulting growth was, of course, the colour reaction presented by the different organisms. *B. coli* and *B. lactis aerogenes* both ferment the lactose contained in the medium, with the production of a large amount of acid; consequently, the litmus in the medium around a colony due to the multiplication of either of these bacteria assumes a pronounced red tint. In the case of the first and second plates of a series where the colonies are numerous and closely packed, the whole of the medium takes on this colour, and none of the original tint remains. In the third plate, however, where the colonies are widely scattered, each is surrounded by a larger or smaller haze, or halo, of a reddish colour, areas of unaltered violet-tinted medium being present between the colonies. The other bacteria, *B. dysenteriæ*, *B. enteritidis*, and *B. typhosus*, on the other hand, do not ferment lactose, and consequently, no red coloration is present. On the contrary, these bacteria produce a definite amount of alkali in the course of their growth, which results in a distinct "blueing" of the medium in the immediate vicinity of the colonies, although without the production of a definite halo, as occurs with *B. coli;* and in the case of crowded plates, the medium throughout takes on a uniform blue tinge, varying from violet-blue in the case of *B. enteritidis* and ultramarine with *B. typhosus*, to a paler sky-blue with *B. dysenteriæ.*

---

[1] *Trans. Path. Soc.*, London, vol. lv., 1904, part 1.

When the cover of the plate is removed, and the cultivation held a few inches above a piece of white paper and the colonies are viewed from above, all (with the exception of those colonies due to the growth of *B. typhosus*, which are quite translucent, and, when small, almost invisible) appear opaque and white; this white colour, however, shows a distinctly violet tint in the case of *B. enteritidis*, bluish in *B. dysenteriæ*, and a brownish pink in *B. coli*. These colour reactions, together with the reddish haze around the colonies of *B. coli*, are sometimes difficult to make out by this method; on the whole, I think they are seen better by holding up the plate cultivation (having first removed the cover), parallel to and slightly above the level of the eyes, in front of a window, and examining the colonies against a sky background. When viewed in this manner, young cultures (18–24 hours) of *B. typhosus* are transparent and drop-like but of a bright blue colour. *B. enteritidis* at the same age closely resembles *B. typhosus*, but is more violet in hue; *B. dysenteriæ* is slightly opaque, and, perhaps consequently, a paler blue than *B. typhosus*. *B. coli* and *B. lactis aerogenes* are quite opaque, of a bright brick red or salmon colour, and are surrounded by a bright red halo due to the reddening of the litmus in the immediately surrounding medium.

Odour.—A further characteristic, and one only less striking than the colour reaction, is the distinct odour that emanates from plates of *B. dysenteriæ*. *B. coli* and *B. lactis aerogenes* emit a smell resembling that of paste, and in the case of old cultures, that of sour paste. *B. typhosus* and *B. enteritidis* yield no distinctive smell, but all the strains of *B. dysenteriæ* that were examined, and one of the "pseudo" dysenteries, yielded a powerful odour of fresh seminal fluid—"spermin," which is unmistakable and quite characteristic.

Minute characters.—On studying the individual colonies produced by these organisms microscopically (with the aid of a $\frac{2}{3}$- or $\frac{1}{6}$-inch lens) at different stages of their growth, further differences can be made out; these minute differences, however, are of but little practical assistance in the routine work of isolation.

PART III.

Certain biological characters, which have hitherto received but scant notice, such as the requirements of *B. dysenteriæ* as to atmosphere, reaction of medium, and temperature, next claimed attention. These were each investigated in turn, and as each optimum was determined our experiments were repeated under conditions which provided for the inclusion of these various "*optima*."

The atmospheric requirements were quickly determined by preparing tube and plate cultivations of the various strains upon different media, and incubating them under aerobic conditions.

The resulting growths were then carefully compared with similar preparations cultivated in Buchner's tubes and in Bulloch's apparatus—that strictly anaërobic conditions were obtained by these means being demonstrated by the decolorisation of the nutrient media which had been tinted with alcoholic solution of methylene-blue, previous to inoculation.

(Experiments on the behaviour of these organisms in atmospheres of hydrogen, carbon, dioxide, etc., were not undertaken.)

These observations showed that, although *B. dysenteriæ* grew well in the absence of free oxygen, the growth was distinctly less luxuriant than that exhibited by cultures to which oxygen was freely supplied, though otherwise placed under comparable conditions.

With regard to the *reaction* of the medium particularly affected by *B. dysenteriæ*, it was observed that, although growth took place upon media ranging between −5 and +15 (Eyre's scale), the "optimum" reaction was to be found somewhere between +2·5 and +5, but varying within these limits with different strains.

Turning now to the question of temperature, numerous experiments show that below 10° C. practically no growth of the bacillus takes place; and, as previously mentioned, although multiplying fairly freely at the temperature of the cool incubator (22° C.), growth is comparatively slow: at the temperature of the body, however (37°·5 C.), the development is luxuriant and strong. Growth almost equally good takes place at a temperature of 42° C., but above this temperature the bacillus gives evidence of impaired vitality, and above 45° C. growth ceases. These results are quite in accord with those of other observers. The thermal death-point determinations, however, yielded slightly different figures from those previously recorded—68° C. for twenty minutes—differences no doubt due to fallacies in earlier experiments in this connection. My own observations were carried out under "standard" conditions, as suggested in a recent paper,[1] with the help of the accurately adjusted water bath described therein, namely, the exposure of 5 c.c. of an emulsion of an optimum cultivation of *B. dysenteriæ* in salt solution (of such a strength that 1 c.c. of the emulsion contained 2 mgrms. of culture) in a water bath, to a known temperature for a period of ten minutes, and utilising the entire 5 c.c. for the purpose of preparing nutrose agar plates and broth cultivations to determine the number of bacteria remaining alive. This process was carried out at varying temperatures, differing by half a degree between 50° C. and 65° C., until that temperature was determined at which a ten minute exposure sufficed to kill all the bacteria present in the emulsion—as shown by the absence of growth macroscopically and microscopically in the cultivations after seven

---

[1] Dalton and Eyre, *Journ. Hyg.*, vol. iv. 1904, April.

Table III.—*Thermal Death Points: Result of Exposure of* 5 *c.c. of Emulsion of Bacilli to undermentioned Temperatures.*

	56° C.		56·5° C.		57° C.		57·5° C.		58° C.		58·5° C.		9° C.		59·5° C.		60° C.		60·5° C.	
	Plates.	Broth.	Plates.	Broth.	Plates.	Broth.	Plates.	Broth.	Plates.	Broth.	Plates.	Broth.	Plates.	Broth.	Plates.	Broth.	Plates.	Broth.	Plates.	Broth.
Strain VI. . .	+	+	–	+	–	+	–	+	–	+	–	+	–	–	–	–	–	–	–	–
,, VII. . .	+	+	–	+	–	+	–	+	–	+	–	+	–	+	–	–	–	–	–	–
,, VIII. . .	+	+	–	+	–	+	–	+	–	+	–	+	–	+	–	–	–	–	–	–
,, IX. . .	+	+	–	+	–	+	–	+	–	+	–	+	–	–	–	–	–	–	–	–
,, X. . .	+	+	–	+	–	+	–	+	–	+	–	+	–	–	–	–	–	–	–	–
B. coli . . .	+	+	+	+	+	+	+	+	–	+	–	+	–	+	–	+	–	+	–	–
B. enteritidis (Gärtner) .	+	+	+	+	+	+	+	+	–	+	–	+	–	+	–	+	–	+	–	–
B. typhosus . .	+	+	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

days' incubation at 37° C. The results were carefully controlled by determining simultaneously the thermal death-point for each of several others of the *Coli* group—*B. coli communis*, *B. enteritidis* of Gärtner, and *B. typhosus*—and further controlled by repeating the experiments on several occasions. From these experiments the thermal death-point of *B. dysenteriæ* may be deduced as between 58°·5 C. and 59°·5 C., that is fully a degree lower than that of *B. coli* and of *B. enteritidis*, but three degrees higher than that of *B. typhosus*. All these results are tabulated below in Table III., and in explanation of the lack of growth upon the plates it must be pointed out that never more than 1 c.c. of the emulsion after heating was utilised for smearing the nutrose agar plates, on account of the difficulty of dealing with larger quantities by this method, the remaining 4 c.c. of emulsion being used for broth tube cultivations.

PART IV.

The results of the observations recorded thus far upon the dysentery bacilli obtained from different sources, may again be summarised by saying that although indistinguishable microscopically, cultural experiments serve for their differentiation into two distinct groups, the one including the Strains II. (Strong), III. (Duval), and V. (Harris-Manilla), and characterised by the production of indol in peptone-solution cultivations and the fermentation of the polyatomic alcohol mannite to the point of acid production; and the other including Strains IV. (New Haven), VI., VII., and VIII. (Shiga), IX. (Kruse), X. (Eyre), none of which produce indol or ferment mannite.

It now remained to investigate the action of immune sera upon these different bacilli, and to determine whether the grouping indicated above was one based upon merely accidental cultural characters, or whether "specific" differences could be shown to exist between the two groups—in other words, whether or no such immune sera were "isopathic." To this end several full-grown healthy rabbits were selected, and the immunisation of each commenced against some one or other of the various strains under observation. The method employed was to emulsify one loopful (approximately 2 mgrms.) of a twenty-four hour old "optimum" agar cultivation in 1 c.c. of sterile salt solution (0·6 per cent.), kill the bacilli by exposing the emulsion, in a water bath, to a temperature of 60° C. for one hour, and then to inject the "killed" culture into the dorsal vein of the rabbit's ear. The injection was repeated at frequent intervals, until the rabbit's serum exhibited a fairly highly agglutinating power when tested against the particular bacillus employed in its immunisation.

In this connection I would remark upon the difficulty of successfully immunising rabbits against these bacteria, and particularly against the "Shiga" strains, the toxicity of the killed cultures being such that even the small doses which were employed frequently resulted in the death of the animal—so that of the ten animals set apart for the production of immune sera, only three survived the inoculations and yielded sera of sufficiently high *titre* to repay the trouble entailed in the process of immunisation.

The technique of the agglutination tests, as at first carried out, was as follows:—Plate cultivations were made upon nutrose agar from each of the different strains of bacilli, and a broth cultivation was prepared from a single colony selected from the "third dilution" plate in each set. After eighteen hours' incubation at 37° C., these broth cultivations were examined microscopically in hanging-drop preparations, to determine their freedom from auto-agglutination—as evidenced by the absence of already existing "clumps." Next, several dilutions, 1:10, 1:20, 1:50, 1:100, and so on, were prepared from the immune serum under observation, with the help of the sterile salt solution. For the microscopical test one drop of the cultivation was added to and mixed with one drop of the selected dilution upon a coverslip, the coverslip inverted on to the cell of a hanging-drop slide and examined microscopically with the aid of a $\frac{1}{8}$ in. objective at once, after the lapse of half an hour, and again at the end of an hour, and if necessary, at the end of two hours.

Many difficulties are encountered in carrying out the microscopical agglutination test with dysentery bacilli—largely on account of their immobility; and for this reason the time limit of observation, which is usually fixed at half an hour in performing the Durham-Grüber test for typhoid, must be extended to one, or even two hours, before recording a definite result. The reaction can, it is true, be hastened by gently rocking the hanging-drop preparation in the intervals between the observations, and for this purpose the photographer's "automatic rocking" developing dish makes a very convenient table upon which to rest the hanging-drop preparations—the rocking, be it noted, having no effect whatever upon mixtures of bacilli and non-specific sera, and by warming the preparations to 37° C.; but in my opinion the employment of such aids to agglutination are to be deprecated.

For the macroscopical test, a different procedure was adopted. An agar-streak cultivation was prepared from a single colony from each strain (after plating), and incubated at 37° C. for eighteen hours. One c.c. of a given dilution of the serum employed in the test was then pipetted into a small test tube of narrow calibre, and a loopful (approximately 2 mgrms.) of the agar cultivation rubbed up into a smooth emulsion with a minute quantity of the diluted serum on the inner side of the wall of the test tube, and finally mixed with the bulk of the diluted serum. By holding the test tube somewhat above the level of the eye and looking at the emulsion against a cloud background, the formation of flocculi could be readily and immediately detected in low dilutions of specific sera; while in the higher dilutions the reaction might often be delayed for one or two hours, although, as in the case of hanging-drop preparations, it could be hastened somewhat by slightly warming the mixture and by gentle agitation.

Later on, in "repeat" experiments, the method was modified considerably in the direction of simplicity and rapidity of putting up the preparations, although the time needed for the observation was considerably increased.

The dilutions of serum were prepared as before, also the eighteen-hours old cultivation of each bacillus in broth. One c.c. of the serum dilution was pipetted into a small test tube, and to this was added 1 c.c. of the broth culture of the bacillus to be tested, and admixture effected by gentle shaking. The turbid fluid was then allowed to stand, at the room temperature, for six or even twelve hours. At the end of this time auto-sedimentation was well advanced, and at least the upper half of the column of fluid appeared clear, whilst the lower portion was still turbid from the deposition of bacilli. The tube was then gently shaken, when, if a positive reaction had occurred, minute flocculi would be seen suspended throughout the otherwise clear fluid, a negative reaction being indicated by uniform turbidity. The macroscopical observation was controlled by removing a loopful of fluid from the tube and examining it microscopically in a hanging-drop preparation.

Before proceeding to test the bacilli against the various immune sera that were available, it became necessary to test for the possible presence of agglutinins in normal sera. For this purpose each of the strains of bacilli, and also each of the control bacteria, was put up in 1:5 and 1:10 dilutions of blood serum obtained from man, the horse, goat, and rabbit respectively. Strain I., *B. coli*, *B. typhosus*, and *B. enteritidis*, showed the formation of a few small clumps microscopically in the 1:5 dilution of human serum, the remaining bacilli giving negative results. None of the other sera examined gave "clumping" with any of the bacilli even in 1:5 solutions. Next, the entire series of bacilli were tested against the serum of a horse immunised against *B. typhosus*, and a similar serum from a rabbit. Each of these sera had a *titre* when tested against *B. typhosus* from several different sources, of 1:2000 at least. Strains I. and III. gave a partial reaction naked eye, and microscopically with 1:10 dilution; *B. enteritidis* gave a partial reaction with a dilution of 1:20.

The test was next repeated with serum obtained from a rabbit immunised against *B. coli communis*, with the result that Strain I. was agglutinated by a dilution of 1:200, and *B. typhosus* by a dilution of 1:10, *B. coli* being agglutinated by this serum in a dilution of 1:500.

Finally the various strains of bacilli were tested against the following immune sera:—

(a) { Kruse (horse) (for which I was indebted to Dr. Todd).
Kruse (rabbit).

(b) { Shiga (goat) (for which I was indebted to Professor Kolle).
Shiga (rabbit).

(c) Harris (horse serum) (for which I was indebted to Professor Flexner).

(d) Eyre "H"(rabbit).

The results obtained showed most markedly the intimate relationship existing between the Shiga, Kruse, and Eyre strains of bacilli, and the clear demarcation of the bacilli comprising this group from the remaining strains of bacilli included in the investigation.

The Kruse horse serum agglutinated Strains VI., VII., VIII., IX., and X., in dilution of 1:150, but had no effect in Strain I., and practically none on Strains II., III. (1:10), and V. (1:20). It, however, agglutinated Strain IV. in dilution of 1:50. The Kruse rabbit serum agglutinated Strains VI., VII., VIII., IX., and X., in distinctly higher dilution (1:400), but left the other strains absolutely untouched.

Shiga goat serum was of a high *titre*, and agglutinated Shiga, Kruse, and Eyre strains in 1:500, had a slight effect on Mott, Strong, Duval, and Harris-Manilla strains (1:20), and a more marked effect on the New Haven strain (1:200); whilst the Shiga rabbit serum only agglutinated the Shiga, Kruse, and Eyre strains (1:150), and gave no reaction whatever with the remaining strains. Practically the same result was obtained with the Eyre "H" rabbit serum. Harris horse serum, on the other hand, agglutinated Duval, Shiga, Kruse, and Eyre strains 1:100, and New Haven strain 1:50, but gave a good reaction 1:500 when tested against Strong and Harris strains.

These results will be more readily appreciated after consideration of Table IV., in which they are set out in parallel columns.

In conclusion, I wish to tender my thanks to Captain R. Tilbury Brown, R.A.M.C., for much valuable assistance in the performance of the numerous cultural experiments necessitated by the investigation.

TABLE IV.—*Agglutination Reactions.*

	IMMUNE SERA.								NORMAL SERA.			
	Kruse.		Shiga.		Harris.	Eyre "H."	Typhoid.	*Coli.*				
	Horse.	Rabbit.	Goat.	Rabbit.	Horse.	Rabbit.	Horse.	Rabbit.	Man.	Horse.	Goat.	Rabbit.
No. I.	...	...	1 : 20	...	...	...	1 : 5	1 : 200	1 : 2	...	...	...
,, II.	1 : 10	...	1 : 20	...	1 : 500	...	...	...	...	...	...	...
,, III.	1 : 10	...	1 : 20	...	1 : 100	...	1 : 5	...	...	...	...	...
,, IV.	1 : 50	...	1 : 200	...	1 : 50	1 : 10	...	...	...	...	..	...
,, V.	1 : 20	...	1 : 20	...	1 : 500	...	...	...	...	...	...	...
,, VI.	1 : 150	1 : 400	1 : 500	1 : 150	1 : 100	1 : 200	...	...	...	...	...	...
,, VII.	1 : 150	1 : 400	1 : 500	1 : 150	1 : 100	1 : 200	...	...	...	...	...	...
,, VIII.	1 : 150	1 : 400	1 : 500	1 : 150	1 : 100	1 : 200	...	...	...	...	...	...
,, IX.	1 : 150	1 : 400	1 : 500	1 : 150	1 : 100	1 : 200	...	...	...	...	...	...
,, X.	1 : 150	1 : 400	1 : 500	1 : 150	1 : 100	1 : 200	...	...	...	...	...	...
B. coli	...	...	...	...	...	...	...	1 : 500	1 : 2	...	...	...
B. typhosus	...	...	...	...	...	...	1 : 2000	1 : 10	1 : 2	...	...	...
B. enteritidis	...	...	...	...	...	...	1 : 20	...	1 : 2	...	...	...

The absence of figures indicates that no agglutination was observed even in 1 : 5 dilutions.

THE ASSOCIATION OF OVARIAN WITH UTERINE FIBRO-MYOMATA.

By Frank E. Taylor, M.Sc., M.A., M.B. (Vict.), F.R.C.S. (Eng.),
Pathologist, Chelsea Hospital for Women, London.

My attention was directed to the association of ovarian with uterine fibro-myomata by the following case. To examine and report upon the specimen removed at operation formed part of my routine duties as Pathologist to the Chelsea Hospital for Women. During my tenure of this office, I have had about 130 specimens of uterine fibro-myomata to examine. I have also seen many more operated upon, and shown at various societies' meetings, etc., during the last few years. Nevertheless, I can only call to mind having observed the association of uterine and ovarian fibro-myomata once before (in the case of Dr. Giles, quoted below). It is evident, therefore, that this is a decidedly uncommon condition. It is somewhat surprising, however, to find how few cases have been recorded, and how few references there are to this condition, in either English or foreign gynæcological literature. I have accordingly collected all the cases I can find on record. They are so few in number that I propose to narrate them briefly below.

I have to thank Dr. Inglis Parsons for kind permission to publish the following case:—

Case 1.—*Fibro-myomata of uterus and ovary; operation; recovery.*—E. B., a single woman, æt. 33, was admitted into Chelsea Hospital for Women, under the care of Dr. Inglis Parsons, on 3rd November 1902, complaining of "floodings." Menstruation commenced at the age of 13, and until six years ago the periods only lasted four days; the loss was moderate in amount, and never contained clots. This function was unaccompanied by pain. For the last six years the periods have lasted longer, and clots have been passed in the discharge. She also suffered a dull aching pain while passing the clots. Since February 1901 the condition has been getting much worse, especially with respect to the bleeding. At Easter 1901 she was an in-patient at another hospital for five weeks, and was there treated with douches, from which she gained some benefit. During these six years she has had a white discharge for seven to ten days after the cessation of the period. There had never been any bleeding between the periods. There had also been some frequency of micturition during the last fortnight. On vaginal examination, the cervix was found to be elongated, and presented a "pin-hole" os. The uterus was low down, freely movable, and retroverted. In front of it was a hard mass, which was diagnosed as a fibroid tumour of the uterus. On 11th November ether was administered. The uterine sound passed backwards for 3 in. The cervix was dilated, the uterus curetted, and iodized phenol applied. The endometrium removed by the curette was very thin, and the uterus was felt to be enlarged from the presence of multiple fibroids.

A year later, on 20th November 1903, the patient was re-admitted into hospital, as no improvement had followed on the curetting. During the intervening year the menstrual periods had been very irregular and frequent. The loss of blood is greater than before. She complains of slight pain in the right iliac region, and more severe pain over the sacrum, where "it seems as if the back was going to break." There is still increased frequency of micturition at times.

On abdominal examination, a small resistant mass was felt, on deep palpation, immediately above and to the left of the pubic symphysis. It was of dense consistency, but no definite margin could be made out, and no conception of its mobility could be formed.

Vaginal examination was difficult, on account of the narrowness of the vagina. The uterus could be felt to be monopolised by a fibroid tumour, which was situated, for the most part, to the right of the uterus, and extended very close to the lower part of the cervix. The mobility of the uterus was not great.

On 1st December 1903, Dr. Parsons performed supra-vaginal amputation of the fibroid uterus, removing at the same time the left uterine appendage: the right appendage being normal, was left behind. The abdominal wound was closed in three layers. Recovery was rapid and uneventful, the temperature reaching 100° only on the day after operation. On 8th December the stitches were removed; there was complete primary union.

Pathological report.—The specimen consists of a fibroid uterus, with one appendage attached. The uterus contains two interstitial fibromyomata, of the size of a billiard ball and a walnut respectively. They are well encapsuled, hard, and on section present the white, glistening, cotton-ball-like appearance so typical of uterine fibro-myomata. In addition, there are in the uterine walls numerous minute fibro-myomatous nodules, to which Mr. Bland-Sutton has given the name of "seedling fibroids."

The ovary presents at one pole a firm non-encapsuled fibrous-looking tumour, with a white homogeneous appearance on cross section. It is about the size of a marble, one-half being embedded in the ovary, whilst the other half projects from its surface. On microscopic examination, it was found to be composed of interlacing bundles of fibrous and unstriped muscular tissue. So similar is this appearance to that of a uterine fibro-myoma, on microscopic examination, that the two could not be differentiated.

I am indebted to the kindness of Dr. Walter Tate for the following account of a hitherto unpublished case, the specimen having been shown at the meeting of the Obstetrical Society of London, on 6th April 1904:—

CASE 2.—*Fibro-myomata of uterus and left ovary; carcinoma of body of uterus; operation; recovery.*—S. V., æt. 65, single. Catamenia began at 13; regular, seven to eight days. Twenty-five years ago suffered from hæmorrhage for a time, with some metrorrhagia and dymenorrhea. Saw doctor, who said patient had a tumour, which would cause no trouble after the menopause. Symptoms gradually improved, and patient remained regular afterwards, to 55. From 55 up to present time has had no regular periods, but continuous irregular bleeding, worse during six months before admission. On admission, 23rd November, patient had a large mass of fibroids in lower abdomen, reaching up to umbilicus, and a hard tumour, size of large potato, in posterior part of pelvis, behind cervix.

Abdominal hysterectomy, 20th November 1903.—Uterus removed by flap method. Tumour in pelvis proved to be a fibroid of left ovary. Right appendage also removed. Uterine tumour = 5 lb. 2 oz. Consists of large mass of fibroids, varying in size from pea to fœtal head. Most of fibroids interstitial, some subperitoneal and submucous. Largest fibroid in section shows some necrotic change. Cavity of uterus much distended, occupied by a large mass of slough near growth. This malignant growth invades muscular centre of uterus, but does not involve the submucous fibroid. Microscopically the growth is a columnar carcinoma. The fibroid of ovary weighs 1 lb. 4 oz. It is very hard, and white in section, and shows patches of calcareous degeneration. Right ovary removed is atrophied.

The following cases have been gathered from the literature of the subject:—

CASE 1.—*Multiple uterine fibroids; fibro-myoma of ovary; operation; recovery.*—Dr. A. E. Giles showed a specimen of co-existing fibro-myomata of the uterus and ovary, at the meeting of the Obstetrical Society of London, on 3rd Dec. 1902. The specimen was removed from a woman, æt. 30, who had been married six months. For five months she had noticed an abdominal swelling, and had suffered from hæmorrhage, pelvic pain, frequency of micturition, and obstinate constipation. The uterus was involved in a mass of multiple myomatous growths, which filled the pelvis and rose into the abdomen. At the operation the right ovary was found to be the seat of a solid tumour the size of a small egg, and it was therefore removed with the uterus. The left ovary was healthy, and was not removed. The patient made a satisfactory recovery.

The pathological committee of the Obstetrical Society made a careful examination of this specimen, and reported as follows:—"The specimen consists of the body of the uterus enlarged to the size of a fœtal head by multiple fibro-myomata in its walls. On the right side, the tube, mesosalpinx, and ovarian and round ligaments are normal. The ovary has been laid open, and is smaller than it was in the fresh state, owing to the rupture of cysts; it measures now 2 × 1½ × 1 in. It has developed a very firm, rounded, new growth, measuring 1½ in. in diameter, with a sharp outline, and distinctly encapsuled. It approaches the free surface at one point, but is everywhere covered by ovarian tissue. On microscopic examination the growth proves to be a fibro-myoma."

The points of interest in this specimen, Dr. Giles thinks, are, first, the association of the ovarian and the uterine fibro-myomata, and states that "this association, though not unknown, is uncommon," and secondly, the tumour is small enough to illustrate in a satisfactory manner the mode of growth of ovarian fibromata, as demonstrated by

Fairbairn (13) in his paper on "Fibroid Tumours of the Ovary," read before the Obstetrical Society in May 1902. A complete capsule of ovarian tissue is found surrounding the growth, and from the preponderance of ovarian tissue, at the outer extremity, it appears that the fibroma arose from the inner pole of the ovary close to the ovarian ligament.

Case 2.—*Multiple uterine fibroids; ovarian fibroma; operation; cure.*—Peraire (2) records the case of a patient, æt. 45, who had suffered from severe abdominal pain and pain along the course of the sciatic nerve for seven years. There were also troubles arising from compression of the bladder and intestines. For two years she had had a vaginal discharge, which was watery, bloody, ichorous, sometimes fœtid and often profuse.

The diagnosis of multiple uterine fibro-myomata was made, and operation decided upon on account of the pain, which was becoming intolerable. On 23rd March 1903, the uterus was removed by supra-vaginal hysterectomy, and the uterine appendages of both sides were removed. Recovery was uneventful, the patient being discharged a month after the operation.

An examination of the parts removed showed that there were numerous fibromata projecting irregularly from the surface of the uterus, varying greatly in size. The total weight of the uterine mass was upwards of four kilogrammes. The tumours were interstitial and subperitoneal. On section, several of them exhibited small cystic cavities with reddish contents and foci of interstitial hæmorrhage. One of them the size of a walnut, situated some distance from the uterine cavity, had greyish, purulent, fœtid contents. Some of the fibromata were of a yellowish colour, having undergone fatty degeneration.

There were fibromata in both ovaries, one pedunculated the size of a pea, and the other sessile. The right Fallopian tube also bore two fibromata of the same size. This case is of interest from the multiplicity of the organs affected by fibromatous growths; the condition might not inaply be termed "fibromatosis."

Case 3.—*Abdominal hystero-salpingo oöphorectomy by a new method, for multiple fibroids of the uterus, fibroid of ovary, etc.*—Coplick Stinson (3) records the case of a patient, æt. 33, married, general health good; had never menstruated in her life. At 17 years of age she began to complain of severe pelvic pains, which lasted several days every month. For several years she had also had pain at other times, more severe in the left ovarian region and in the back. There were also constipation, painful defæcation, straining at stool, and the occasional passage of blood *per anum.* The lower abdomen was painful and tender, especially on the left side. The fundus uteri was somewhat enlarged, irregular in shape, and drawn over to the right side of the pelvis. On rectal examination, a hard mass was felt, which was connected with the posterior uterine wall and pressed against the rectum.

Abdominal hystero-salpingo oöphorectomy was performed by enucleation. The uterus was slightly larger than normal, and was covered with multiple small fibroids. The largest tumour, the size of a walnut, was situated low down on the posterior surface of the uterus, and was the one which had pressed on the rectum. At the lower part of the body of the uterus, and continuous with it, was a smaller fibroid, which had sprung from the cervix. The ovaries and tubes were ill-developed. The tubes were about one-half the normal circumference, but otherwise normal. The left ovary was about twice the normal size, and contained multiple serous cysts, which, when opened, showed that there was no normal ovarian tissue present. The right ovary was about half the normal size, pale, cirrhotic, and on its surface was a small pedunculated fibroid. There is no record of any microscopic examination of the tumour.

The chief interest in this case lies not merely in the association of uterine and ovarian fibro-myomata, but in the growth of fibro-myomatous neoplasms in under-developed organs.

CASE 4.—*Genital fibromatosis; fibromata of ovary, uterus and broad ligament.*—Jacob's (4) patient was 52 years of age, and the specimen, on examination after removal, showed the uterus to be enlarged by the presence of several small interstitial fibroids scattered through its substance. A fibroma the size of a mandarin orange existed on the posterior surface of the uterus, and another tumour of the same nature was attached by a broad pedicle to the subvaginal portion of the cervix, and extended into the broad ligament. The right appendage was healthy. The left ovary was the seat of a large fibroma, the pedicle of which was twisted three times, and the tumour in consequence of this had undergone consecutive necrobiosis and had originated some peritonitis.

CASE 5.—*Fibro-cystic tumour of the uterus; fibroma of the left ovary and broad ligament; operation; cure.*—Pean (5) records the case of a single woman, æt. 41, who had an abdominal tumour which was diagnosed as a fibro-cystic tumour of the uterus. She was submitted to the operation of "hysterotomie," as hysterectomy was called in those days (1869). At the operation there was much doubt as to the relations of the parts. The abdomen was occupied by a multilocular cystic tumour which appeared to spring from the right side of the pelvis, and by "a fibrous tumour which sprang either from the right ovary, or even from the fundus of the uterus itself."

CASE 6.—*Multiple fibro-myomata of uterus and myoma of ovary.*—In Orthmann's (6) case, during supra-vaginal hysterectomy for multiple fibro-myomata of the uterus, a tumour was discovered in the left ovary, which was accordingly also removed. The size of the tumour was as follows:—Length and breadth 5 to 6 cms., thickness 3·5 to 4 cms. It retained the size of the ovary, and was so hard as to give the impression of being a calcified fibroma. Its surface was smooth, with some small rounded protuberances. Near the tube was a small flattened corpus luteum hæmatoma. On section, the tumour was seen to be composed of round hard nodules of a white colour, and it was more or less surrounded by a distinct capsule, which was thickest in the neighbourhood of the hilum, where there were also seen the corpus luteum hæmatoma, old corpora lutea, and numerous corpora albicantia. Microscopically, the tumour was composed of thick bundles of unstriped muscle-fibres with abundant nuclei, and between the muscle-bundles firm connective tissue was interspersed. The tumour contained very few blood-vessels. The capsule in its entire extent consisted of normal ovarian tissue.

Cases 7 and 8.—In studies on the degenerations and complications of uterine fibroids, both Noble (7) and Frederick (8) have given statistical tables of the various complications, and in each series one example of the co-existence of uterine and ovarian fibro-myomata is mentioned, though no details of the cases are given. In Noble's list the association of ovarian with uterine fibro-myomata occurred once in 258 cases, and in Frederick's once in 125 cases.

The following case, although recorded as one of co-existing uterine and ovarian fibroids, cannot be accepted by the critical reviewer, on account of the differences of opinion on its microscopic characters. It is, however, of great interest on this very account, and may be included here, as showing the very great difficulty there may be in coming to a correct diagnosis in the case of solid ovarian tumours even on microscopic examination.

Case 9.—*Fibroids of uterus and ovary; operation; recovery.*—Dr. Leith Napier showed a specimen at the meeting of the Obstetrical Society of London, on 5th February 1896, which he had removed from a woman, æt. 34, who had been married four years. She had never been pregnant, nor had any previous illness. Her menstrual periods were first seen at thirteen years of age, when they were regular and normal. After marriage the periods were slightly more frequent and of longer duration, though the quantity lost was less than previously. She complained of neuralgia in the head and neck, which for the past six months had always been worse on the day preceding menstruation. Bowels regular; bladder irritable, micturition frequent during the day, and at times also during the night.

Physical examination showed the uterus to be normal in size and position. To the left of the uterus was a very hard, irregular, nodulated lump the size of a small Tangerine orange; and attached to, but distinctly separable from the uterus. The lump was not tender. A diagnosis of solid ovarian growth, or possibly of subperitoneal growth was made. Exploration with a view to its removal was advised, and refused. A month later, consent to operation was obtained on account of the rapid increase in size of the tumour. The uterus and appendage were accordingly removed on 14th October 1895. Recovery was uneventful.

The tumours were examined by Dr. Kanthack, who regarded all the growths—both of the uterus and ovary—to be simple fibromata. Dr. Napier agreed with regard to the uterine tumours, but expressed his doubts as regards the ovarian growth, as he was "inclined to be sceptical about true fibromata of the ovary being nearly so common as sarcomatous growths." Dr. Cullingworth, Dr. Handfield Jones, Mr. Alban Doran, and others present upheld Dr. Kanthack in regarding the growth as a simple fibroma of the ovary. It was then submitted to the pathological committee of the Obstetrical Society. The majority, consisting of Mr. Bland-Sutton, Dr. Cullingworth, and Dr. Napier, reported as follows:—

"The specimen is somewhat shrunken, having been kept in spirit for nearly two months; consists of a solid lobulated tumour 6¼ in. in circumference, 2¾ in. in length, and 1½ in. in width. The weight is 3¼ oz. Its outer aspect is smooth, except over an area ⅝ in. in diameter, which represents its attachment. On section, the tumour is very hard in consistence, and presents a fibrinosed appearance, whitish bands dividing it irregularly. A section through the whole thickness of the tumour presents, microscopically, the characters of a spindle-celled sarcoma of the ovary."

Dr. Griffith, however, reported separately on the microscopical characters of the tumour as follows:—

"I am of opinion that the tumour has the usual characters of a spindle-celled fibroma of the ovary, and am unable to say with certainty if it is innocent or malignant, but I believed it is innocent."

It will thus be seen that, although fibroid tumours of the ovary—including under this term fibromata, fibro-myomata, and myomata—when existing alone and unassociated with uterine fibroids, may form large tumours which give rise to symptoms of clinical importance and demand operative interference, as the cases of Briggs (10), Doran (11), Griffith (12), and Fairbairn (13) abundantly prove, yet, when ovarian and uterine fibroids co-exist, the former are generally small and of merely pathological interest, since the clinical picture is dominated by the uterine growths. Occasionally, however, the ovarian tumour may reach somewhat larger dimensions, and is then very liable to undergo torsion of its pedicle, as is so often the case with cystic tumours of the ovary. In this event they are very liable to undergo consecutive necrobiosis, which may be the starting point of an attack of peritonitis, either localised to the pelvis or becoming general.

REFERENCES.

1. Giles.—"Fibroma of the Ovary," *Trans. Obst. Soc. London*, 1902, p. 360. 2. Peraire.—*Bull. Soc. anat. de Paris*, 1903, p. 378. 3. Stinson, *Am. Journ. Obst.*, N.Y., 1901, vol. xli. p. 458. 4. Jacobs.—*Bull. Soc. belge de gynec. et d'obst.*, 1900, No. 10, p. 249. 5. Pean.—*Bull. Acad. de méd.*, Paris, 1872; "Leçons de clinique chirurgicale." 6. Orthmann.—Martin's "Handbuch der Krankheiten des weiblichen Adnexorgane," Bd. ii. S. 644. 7. Noble.—"A Study of the Degenerations and Complications of Fibroid Tumours of the Uterus," etc., *Am. Gynæc. and Obst. Journ.* N.Y., 1903, vol. ii. p. 277. 8. Frederick.—"Uterine Fibro-myomata, with especial reference to their Degenerations and Complications, etc.," *ibid.*, 1902, vol. i. p. 255. 9. Napier.—*Trans. Obst. Soc. London*, 1896, p. 29. 10. Briggs.—"Fibroma of the Ovary," *Brit. Med. Journ.*, London, 1897, vol. i. p. 1083. 11. Doran.—"Fibroma of the Ovary," *Trans. Obst. Soc. London*, 1896, p. 187. 12. Griffith.—"A Case of Obstructed Labour in which a large Fibroma of the Ovary occupied the Pelvis, etc.," *Trans. Obst. Soc. London*, 1891, p. 140. 13. Fairbairn.—"Fibroid Tumour of the Ovary," *Trans. Obst. Soc. London*, 1902, p. 177, and *Journ. Gynec. and Obst. Brit. Emp.*, 1903.

SOME FIFESHIRE FOLK-MEDICINE.

By DAVID RORIE, M.B., *Cardenden, Fifeshire.*

"FOLK-MEDICINE," says Black in his interesting work on the subject, "comprehends charms, incantations, and traditional habits and customs relative to the preservation of health and the cure of disease, practised now or formerly at home or abroad." Habits and customs of a more or less curious nature we have yet with us in Fife, but the charms and incantations are gone—cremated, doubtless, with the frail bodies of the half-daft beldames who were sent to the stake by an active clerical caste for trespassing on its own special preserve of superstition. But lingering with a singular persistency in most of the rural districts, and stored chiefly in the memories of the older women, we still find some curious ideas; and when we have time and inclination to study them for their own sake, they are not altogether lacking in interest. Should they run counter to our instructions to the patient, we are apt to treat them cavalierly, forgetting the accredited part woman played in the leech-craft of the past. In the more remote parts of the country, she had, like Annot Lyle,[1] some knowledge of the dressing of wounds (for, while the tuilzie lasted, man meddled only with the making of them), and in all parts of the country she had some skill in herbal simples. The lady of the "big house" had her still-room and her cordials to dispense, had the medical books of the time dedicated to her, and even, perhaps, some of her own recipes incorporated in them. And thus she was (no tabulated statement of her results being ever called for) always ready to tackle

"The glengore, gravel, and the gut,
And all the ills that first were put
Into Pandora's purse."

Nowadays the craft, such as it is, has descended into hands more plebeian, and become specialised more particularly perhaps in the art of obstetrics. For has the sonsy dame, twice seven times confronter of the curse of Eve, not more practical knowledge of the handling and the dandling and the dosing of the latest pink-skinned immigrant to this cold world, than the youthful graduate, who, big with theoretical maternity, would shoulder her to the door? "I'se warrant she bude to hae"—unless, perchance, circumstances demand the use of "the irons," when she hangs back, a handless, hysterical hindrance, hinting, and more than hinting, at his unhallowed haste.

The "Kingdom" of a hundred years ago, with its miners, weavers, fishers, and agriculturists, must have presented a wide field for research in this direction; and even yet, when the Forth and Tay bridges have removed much of the clannishness for which Fife was renowned, there are still gleanings for the folk-lorist. For, whether deserved or not, the reputation of being one of a race apart still clings to the Fifer, and the numerous proverbs applied to him bear witness to it. "Fife for fly folk." "He's a whistler" (a play here on the word "Fife"). "Gang to Fife and get a wife" (a canny one who will guard the bawbees). "Clever as the Fife kye—they can knit stockin's wi' their horns." These, and many more like them, give us the outsider's opinion of the race. Some of these sayings the Fife people quote themselves, with a quiet enjoyment of the tribute to their characteristics; others, such as "He's got the Fife complaint—big feet and sair een," they naturally reject as unseemly. But, take him all in all, the Fifer has faith in himself, and it is thus only natural that his beliefs should be parted with slowly and grudgingly.

---

[1] Scott's "Legend of Montrose."

Now, as there is a reason for everything, there is a reason for the survival of folk-medicine. It is long since Dunbar wrote—

"Tak consolatioun
  In zour pane;
In tribulatioun
  Tak consolatioun;
Out of vexatioun
  Cum hame again,
Tak consolatioun
  In zour pane,"

yet the quaint jingle of the old makar still voices the quest of the many—rest from pain be it of the body or the mind. Wherefore, says the ruder son of the soil (and not altogether with unreason), if the orthodox fail to give me what I seek, and that speedily, let me deal in the open market. And straightway he does what he says.

Look at your evening paper, and see how the "bone specialist" can, at a certain hotel in a certain ancient town, on Mondays from 11 to 2, *cure* (O illiterate wonder-worker!) "rheumatics, sciatic, and skin diseases." Bones, presumably, he shoves in also as an organist does his stops. Ask any druggist, more especially a country one, how many rough-and-ready prescriptions of the "hickery-pickery" order he gets in a month. True, the paper is a dirty scrap; the writing is that of a stubby, well-bespat, and halting pencil; but what is on the "line" has done a "warl' o' guid" to some one else—and besides, has it not the special value of heterodoxy?

"And I got the cure frae an auld wife wha got it when she was a young woman frae a man wantin' the legs that was drawn aboot by twa black dogs." So I was told the other day. For the tinker and the tramp, who have dodged the dominie and gained what lore they have from the foul tongues of their forebears, have still rough-and-ready cures to niffer for bite and sup at the cottage door. A hot spell draws them like flies out to the high-roads and bye-roads, padding it where the footing is softer at the roadside's fringe. Dogs are siccar at them, and after a scouther of rain they stink like any brock; but, mark you, they are "skeelie wi' simples, and gey solid crackers: ye'd wonder what gaun-aboot folks ken."

Note, too, the slight touch of the uncanny: "A man wantin' the legs drawn aboot by twa black dogs." Not quite up to the standard of Borrow's Brute Carle of the Danish ballad, for

"A wild swine on his shoulder he kept,
And upon his bosom a black bear slept,
And about his fingers with hair o'er-hung
The squirrel sported and weasel clung";

nor even, I fear, of Aiken Drum, whose

". . . wauchie arms three claws did meet
As they trailed on the grun' by his tae-less feet."

Still, in these prosaic days, it is as near as may be; for a man with two legs drawn about by a horse you can consult any day in the week, but the advice of the other ought to be something "by-ordinar'." The cure, nevertheless, was neither very quaint nor very subtle; for this lousy oracle of the highway, this wandering dog-drawn Witherington, fighting fortune on his stumps, only recommended sheep's kidney fat and Archangel tar for a "scabbit heid efter inockilation wi' bad maitter."

Or take the case where the gude-man was laid up in his roadside cottage with a "poisoned arm," healing slowly—too slowly, the friends thought. To his door came an old hag, sun-tanned, dram-stained, cutty at lip. She noticed the sick man, asked for and got a sight of the arm, and then gave her sage advice—advice that carries you back into the past, how far, it is hard to say. For she advised the splitting up, and applying hot to the diseased surface, of three puppy dogs: that was all. A neighbour with a cross-bred litter doomed to the tub readily handed them over to the tinkler wife's gully; and, antiseptic dressings and all such feckless modernities being abandoned, on went the slaughtered innocents. Certainly *post*, doubtfully *propter hoc*, the arm got better.

Within the last few months, also, I came across a boy who was duly getting, thrice daily, a tablespoonful of the liquor in which a mouse had been boiled. This for enuresis. Another method is to roast the mouse after removing its head, and powder the animal down. The powder is then used for the same purpose. There is an old Fife saying, "Go to Freuchie and fry mice," and it may be a matter of conjecture whether this troublesome complaint was not epidemic there at one time, due perhaps to the proximity of Falkland Palace, and consequent facilities, when kings held wassail, for over-doing liquid refreshment.

To deal systematically with all these cures is not easy: one must cull them as they are happened upon, and they are often best told in the original Doric. Take, for example, the sulphur cure for cramp. You express a doubt of its efficacy? "I was gaun ae day to M—— Kirk, and I cam on an auld wife sittin' by the roadside wha couldna gang a step faurer for cramp. She telt me she had come awa in a hurry wi'oot her sulphur band, and this was the first time for mony a day she had dune't." This sulphur band was a piece of sulphur sewed in a garter and worn round the leg, and is still in fairly common use to keep away cramp. Kept under the pillow at night, a piece of sulphur will act in the same way for all the occupants of the bed; and it is a curious mixture of old and new to see a portion of a sulphur candle, left by a sanitary inspector, promoted to this use. Or the sulphur may be tied in the "oxter." Flowers of sulphur rubbed into a "flyped" stocking and then put on in proper order is a cure for "pains," or rubbed into blue flannel is an application for lumbago. Where "a rush is hingin' aboot a bairn," sulphur and whisky brings it "to the ootside," while sulphur and cream of tartar is a regular Spring drink for "clearin' the blude."

"Pains" (rheumatism), unfortunately, is a common complaint, and any cure is eagerly caught at. Many consequently exist besides the sulphur one. Black slugs "masked" in a teapot with water and salt supply an oil that is useful for rubbing. A potato or a hare's foot carried in the pocket may work wonders. The marrow of bullocks' bones twice boiled may be well rubbed in, or the painful joints may be well switched with freshly gathered nettles. Inwardly, turpentine and coarse sugar, half and half, may be consumed freely.

Slugs have another use—white slugs this time. A quantity of them is placed in a flannel jelly-bag along with a handful of salt, and the resulting oil that drips away is carefully caught and administered like cod-oil in phthisis. I have seen this same "cure" in Lancashire, and in many other parts of England, and the Continent slugs and snails are used in different forms for pulmonary complaints.

The expressions "not strong" and "in bad health" are always, amongst the *hoi polloi*, used to mean phthisical, and great offence may be unintentionally given by saying that a person is "not strong." It is a common and unfortunate belief, both as regards phthisis and other infectious diseases, that an older person is not liable to take infection from a younger; but the other belief, that all bedding and clothes belonging to a deceased phthisical patient should be burnt is an aid to the medical attendant. The clothes in an infectious case may thus be quite safefy washed by an older person: "I dinna think there's ony harm in her washing his claes: she's auld be's him."

When the outset of trouble is heralded by a "grewsin'," care must be taken not to grip any part of the body, for that gripped part is apt to "beel." This is a commonly assigned cause of suppurative mastitis. Further, a mother who while "grewsin'" grips her child may thus give it a severe cold—"I maun hae gruppit it." But more commonly the child "has sookit the cauld" off her.

Whooping-cough being, like pains, common, has many cures. But the greatest stress is laid on the benefit of "change of air." The length of time the change lasts is of no moment. A Saturday to Monday visit to a distance eight miles off is quite enough; and if, through driving or travelling by train, the patient is rendered much worse, the circumstance is certainly unfortunate, but cannot be quoted against the treatment. Not long ago, a patient of mine, a mere infant, with whooping-cough, was taken down the pit by its father and held for ten minutes in a strong draught in an air-course. It died in two days of pneumonia. But of course "we canna help tribble." A short change of air to a gas-works or a lime-kiln is also efficacious, while those who cannot reach these sanatoria can take advantage of freshly dug earth.

This earth cure is also advantageous to miners asphyxiated with "bad air," although the opportunities to practise it are limited somewhat by the spread of first-aid principles. But in days not so long gone by, a hole was dug out for the sufferer's face to lie over, and, when sufficiently recovered to be put to bed, the divot of turf was laid on his pillow, so that, in his slumbers, the gentle breath of Mother Earth might still play round him.

The old idea of ridding one's self of a disease by transference is always cropping up. I mentioned earlier in this paper the puppy-poultice, and the idea in this was undeniably that of transferring the trouble from the human body to the canine. Indeed, I think in many cases of poulticing the same idea is latent. The popular belief is that the efficacy of a poultice lies not so much in the heat and moisture of it, as in its power to "draw the tribble." The disease is "in" until it is extracted; it has to be got out. Some poultices are held to be "awfu' drawin'" things; and "Is it no' drawin' it owre sair?" is a common query. When a blister refuses to rise readily, it is looked on as a bad sign: it is "ill to draw, dour to draw, the tribble's deep in." The commonest cause of criminal assaults on little children is the wish to get rid of venereal disease, and I saw lately a case where a nurse-girl deliberately "smittit" a younger child with impetigo contagiosa to relieve herself of the complaint. When a patient is ill, too, there is always a desire not to take anything that may "feed the tribble." There is a fight going on between the trouble and the "system," and unsuitable medicine or diet may go to help the former instead of the latter. "For ony favour," said a woman the other day, "dinna gie me onything that will gar me eat, for a' I tak' gangs to the hoast and just strengthens it." Behind it all, unknown to the speaker, of course, lies the idea of demoniac possession; just as Zoroaster believed that while a woman suffered from the menstrual flow (which was the work of Ahriman, or the devil) she was not to be allowed to eat as much as she wished, "as the strength she might acquire would accrue to the fiends." Her food even was not to be given by hand, but passed to her with a long spoon, a method of intercourse with devils still quoted by politicians on delicate occasions of international diplomacy.

Hence it is, perhaps, that we get also the idea that those who are not afraid of a trouble will not take it, on the principle of resisting the devil and him fleeing from you. It is an idea which has frequently to be combated when dealing with infectious disease; plenty people, otherwise intelligent, believing that the "trouble's no' catchin'" so long as they "are no' feared at it." The belief is of course an old-standing one. In "Helps for Suddain Accidents" (London, 1633) we find that "Fear corrupts the juices of the brain (through the force of imagination), and makes them fall down and disperse themselves into all the parts of the body filled with a sickly quality, and so contrary to nature. This is the reason why fearful men are apt to die of slight wounds; whereas a valiant spirit has always flesh apt to be healed." An echo here of Ecclesiastes, when he says, "A merry heart doeth good like a medicine, but a broken spirit drieth the bones."

An infectious disease is described as a "catchin' complaint," while for contagious the word "smittle" is properly used. Often, however, "smittle" is used loosely to cover both, and a common expression of disbelief, as regards modern theories of infection, is the question, "Wha smittit the first ane?" And the belief (as regards measles, scarlatina, whooping-cough, etc.) that they are merely "bairns' troubles" and therefore as inevitable as teething, is responsible for much infant mortality; for "Pit them a'thegither an' hae dune w'it," is still occasionally practised. Measles, also, "maunna be wet," and this axiom is frequently made the excuse for leaving the patient in a lamentable state of dirt.

In a slight case of one of the exanthemata, where medical aid has not been invoked, and where the omission has resulted in more of the same kind occurring, the excuse may be offered, that the parents thought it was "only a burst." "He's burst himsel'." explains all skin eruptions, from "plooks" to pemphigus, although an English locum might well be alarmed if summoned to such a case, and forgiven if his mind ran on gunpowder or boilers. The usual cause of a "burst" is a chill following sweating, but the same result is got by a "rash drink o' water," the drinking of which dangerous fluid will either "burst" or "foonder" you. Cold water as a drink in illness is regarded with holy horror by the average female friend in attendance on a sick-bed, who recites with pride how she has refused the natural craving of the sufferer. It is a forbidden fluid, too, in the puerperium, and the medical attendant who permits its use assumes a direct responsibility for all illness that may ensue, be it "chacked" nipples or sudden death. The genuine old-fashioned miner in this country always misses out his back and his knees from his daily ablutions, on coming off his shift, for the reason that washing weakens them. There are thus well-grounded and old reasons for believing that water is not the harmless thing which teetotalers assert.

Change of water is frequently assumed to be as bad for the health as change of air is good. People coming to a new district often blame this for causing illness, especially boils; while living too near running water is supposed to cause decay in teeth. Boils, however, by many are looked on as a sign of rude health, or, at any rate, as only liable to come out on those who are exceptionally well. Another belief of the same nature is that *pediculi capitis* only appear in strong children, and I have known a case of a woman actually collecting these undesirables and transplanting them to the head of a sickly child, under the belief that the invalid would gain strength thereby! Truly a curious piece of muddled reasoning.

THE TREATMENT OF BRONCHIECTASIS.[1]

By D. Barty King, M.A., M.D., M.R.C.P.Ed., *late House Physician to the Brompton Hospital for Consumption and Diseases of the Chest, London, and to the Royal Infirmary, Edinburgh.*

Through the kindness of the physicians at the Brompton Hospital, I have been able to make an inquiry as to the comparative value of various remedies in the treatment of bronchiectasis, and combined with a study of the records of treatment here, I have obtained a fair estimate of these. The methods I wish to describe are the following—(1) Creasote vapour baths; (2) subcutaneous injections of guaiacol; (3) intratracheal injections of guaiacol; (4) intravenous injections of formalin.

The points I wish to refer to specially are the effects of these various remedies on the general condition of the patient; cough, fœtor, and the amount of expectoration; temperature, weight, and the mental condition. Apart from the statements made below, a short note of each case, showing the effects of the various remedies, will be found at the end of this paper.

Creasote Vapour Baths.—It is unnecessary to give here a full detailed account as to the method of giving these baths at this hospital, as this will be found fully described in Fowler and Godlee's book on "Diseases of Lungs," p. 138. The duration of the baths varied from twenty minutes to one hour. The treatment of cases by this method shows that, while the cough itself is lessened, the patient also enjoys a longer interval of freedom from it. When the baths are first given, the amount of expectoration is usually increased, and thereafter, in favourable cases, there is a steady and constant diminution in the amount (*see* Case C. C., No. 1). If the baths, which have been continued for some time, are taken off, there is usually an immediate diminution in the amount, with a subsequent rise. However, in unfavourable cases there is no effect produced at all, or, on the contrary, there may be an increase. In most cases the fœtor is much lessened, and in some it entirely goes (as in Cases C. C., No. 1, and H. S., No. 4). However, in very unfavourable cases it remains as before.

---

[1] Extracted from a gold medal thesis at the University of Edinburgh.

In the great majority of cases the temperature undergoes an immediate lowering, and usually continues so. It also becomes more regular and less remittent. If the baths which have been continued for some time are stopped, the temperature may become irregular and remittent (*see* Case W. S., No. 14)—this is an extremely bad sign in the treatment of these cases by this method. One fallacy comes in here, and it is this, that often when the patient is admitted he has a slightly elevated temperature, which may continue for some time, but if he is allowed to rest without any active treatment, in some cases it returns almost to normal. This is well shown in the case of D., No. 10, and is a point which is apt to be overlooked in describing the effect of such treatment on the temperature. Generally, it may be stated that there is a uniform ratio between the effect on the sputum and temperature, but this is by no means constant; the temperature sometimes being lowered, and at the same time the amount of the expectoration increased.

The occurrence of inverse types of temperature is also to be noted here. This type of temperature is usually looked upon in acute miliary tuberculosis with grave suspicion as heralding a fatal issue, but here it occurs in some of the most favourable cases.

The general condition of the patient in most cases is considerably improved, but this is by no means constant.

As regards the mental condition, this is an effect which is apt to be overlooked. The bronchiectasis case is usually of the melancholic type, but I must say that the effects of these baths in many cases is to render him much more so.

In nearly all the cases the weight is increased, in some very markedly so. (See weights of cases reported.)

It is of interest to note the effects of two or more baths. Case H. D., No. 8, shows a great increase in the amount of sputum as the result of a daily bath; but when three, four, or five daily baths are given, the amount is much diminished. Note also the great diminution in the amount of sputum when the baths are taken off. Curiously enough, Case J. C., No. 6, shows almost the opposite effect, *i.e.*, a slight increase with one bath daily, and a great increase in the amount of the sputum when two baths daily are given. The diminution in the amount when the baths are discontinued is noteworthy, as also its subsequent rise when the two baths daily are continued.

Apart from its disinfectant and bactericidal qualities, creasote is an admirable stimulant expectorant in these cases, but when pushed too far this last quality seems to be much lessened, and consequently part of its value as such lost. However, I should be inclined in every case, during a short period of its treatment, to increase the frequency of the baths to two to four times daily, as the case may be, and so bring the bactericidal properties chiefly to bear on the septic dilatations. I am strongly of opinion that this would lead to better results.

Case C. C., No. 1, a few short notes of whose case are given at the end of this paper, is an example of a complete permanent arrest of the disease. Through the kindness of Dr. Percy Kidd, I had an opportunity of examining this patient two weeks ago, and noting the physical signs, and of taking a screen and X-ray photograph of her chest. She was then in good health, with no cough and no expectoration, and was attending school.

It is worthy to note that the cases which give the most unfavourable results are those of "Tuberculous Bronchiectasis" (*see* Cases W. S., No. 14, and J. C. A., No. 13).

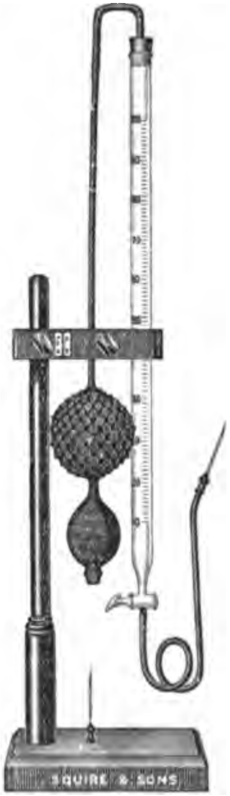
SUBCUTANEOUS INJECTIONS OF GUAIACOL.—In favourable cases the effect on the cough is usually very decided, causing it to be easier and not so constant. The amount of the sputum is increased at first, with a subsequent constant and steady diminution. The temperature is lowered, but the irregularity may continue. The effects of adding creasote baths to the injections are well shown in Cases J. H., No. 3, and A. W., No. 7, by causing the temperature to be lowered and become more regular, with a marked approximation of the morning to the evening temperature. In the case of J. H., No. 3, the dose of injection of sterilised oil of guaiacol in almond oil (1 in 4) was 2 minims daily, increased to 3 c.c. The site of injection was into each buttock alternately. I may mention that the injection caused no local trouble whatever —no obvious inflammation and no abscess formation. In severe types of bronchiectasis it has been found that these small doses sometimes gave unsatisfactory results. A case of this type (Case A. W., No. 7) came into hospital here in September of last year under the care of Dr. Kingston Fowler. It was diagnosed as chronic pneumonia (?) with probable bronchiectatic cavitation. The sputum was intensely fœtid, and no tubercle bacilli were found in it on repeated examination. It was decided to try the effect of large doses on this case. The initial dose was 30 minims of sterilised oil of guaiacol (in almond oil) 1 in 5 daily, and it was increased up to 150 minims. The injections were almost exclusively made into one buttock. The patient was too ill to be out of bed, and in a very melancholic condition. The effect on the sputum was a slight and steady decrease in its amount, with a marked lessening of its fœtor. At times the fœtor would be absent from one to two weeks or more, and then would return for a day. At first the temperature was somewhat lowered and became more regular, but as the doses were increased it became more irregular and of a more remittent type. When creasote baths were added to the injections, the temperature fell almost to normal, and the amount of sputum was increased. The most marked effect of all was, the great improvement in the general condition of the patient, especially the mental condition. I have never seen so marked an improvement in any such cases, however mild. The improvement continued, and she was able soon to be taken down to take the creasote baths. I have to report, however, that the patient suddenly expired while sitting up in bed taking her tea. On post-mortem examination, no cause could be assigned for the sudden death, but the condition revealed was that of chronic pneumonia (unilateral) with a large gangrenous bronchiectatic cavity filled with foul - smelling, pultaceous material.

The improvement was so marked in this inveterate case that I should feel justified in again trying these larger doses.

One interesting point of practical importance in connection with this case is worthy of mention, and that is the local effect of the injections into the buttock. Formerly, when this method of injecting large doses of guaiacol had been tried, it was discontinued in many cases because of the invariable abscess formation which occurred at the seat of injection. Though the buttock was slightly tender and showed some degree of hardness to the touch, no abscess formation occurred, and the number of injections amounted to fifty-two. This was a point of some practical interest, as I had an opportunity at the post-mortem examination of cutting into the buttock and observing the state of the tissues where the injections were made. I found them hard and tough evidently in a state of subacute inflammation, with some small hæmorrhages, but there was no evidence of any pus formation. It should be mentioned that the buttock was thoroughly disinfected with carbolic acid poultices for some days prior to injection, and kept scrupulously clean. The hypodermic needle was boiled every time before use, and the guaiacol solution was specially prepared in small quantities every week. Two series of plate cultures were made from this guaiacol solution, and every plate remained sterile.

Therefore, with strict antiseptic precautions, in most cases, one should never have to discontinue the treatment on account of abscess formation at the seat of injection.

INTRATRACHEAL INJECTIONS.—This method, so strongly advocated by the late Sir Thomas Grainger Stewart, Colin Campbell, and others, is of much value in some cases. It has almost been given up here, but I think there is no doubt as to its value in certain cases, and is well worthy of a trial combined with creasote vapour baths. I record the case of G. S., No. 2, giving the results of this combined method of treatment, with one injection and one creasote bath daily, and also two injections and two creasote baths daily. The effect of the daily intratracheal injection alone was to slightly diminish the amount of the sputum, the temperature remaining much about the same. The fœtor of the sputum was considerably lessened; thereafter, the addition of a daily creasote bath to the injection did not produce much change. Two injections and two creasote baths daily produced an increase in the amount of the sputum generally, with no decided effect on the temperature. The most marked effect was on the extreme fœtor of the sputum, which entirely disappeared, and the general condition of the patient was improved. The dose of injection was 1 drm. of R.; menthol, 10 parts; guaiacol, 2 parts; ol. olivæ, 88 parts,—given once to twice daily.



INTRAVENOUS INJECTIONS OF FORMALIN.—This method of treatment was introduced into the hospital here by Dr. Maguire for the treatment of pulmonary tuberculosis. It is too early yet to give any judicious view whatever as to its success or non-success in that disease.

The apparatus for injection consists of a stand, holding a long glass tube with a stop-cock at its lower end.

The upper end of the tube is fitted with an india-rubber stopper which is perforated by a glass tube to which is attached a ball and air syringe. To the lower end of the long glass tube is attached a piece of india-rubber tubing about 8 in. long, and fitting on to the end of this is a long needle.

The stop-cock being turned off, the long tube is filled with the formalin solution, which just prior to use has been slightly warmed. The stopper is then put into the upper end of the long tube, and the apparatus is then ready for use.

The patient's arm is then thoroughly prepared, as if for operation, over the regions of the median cephalic and median basilic veins. A lightly applied tourniquet (handkerchief) is put around the upper part of the upper arm, and the patient is made to grasp firmly a roller bandage to render the superficial veins more prominent. The stop-cock is first of all turned on to allow the formalin solution to completely fill the needle and rubber tubing attached to it. The needle is then put into either the median cephalic or median basilic vein, the tourniquet being then removed. With the aid of the ball-syringe the formalin solution is gradually forced into the vein, and after the required amount has been run off, the needle is withdrawn and a small pad of lint held over the seat of injection for a couple of minutes or less, and thereafter the patient may use his arm as he pleases with no bad effects. The time of injection varies, but it should never occupy more than one to two minutes. With a larger needle (which is really less painful), the formalin solution (50 c.c.), can be injected in about eleven seconds. I regard this latter of decided advantage and value in increasing the effect of the solution.

The formalin solution should never be strongly heated, as it decomposes. The formula consists of 1 in 2000 solution of formic aldedyde in normal saline solution (0·75 per cent.).

I should add that in giving the injection the strictest antiseptic precautions should be taken. The amount of injection is usually 50 c.c. of a 1 in 2000 solution, given on alternate days during the first week, and daily thereafter. The dose may be increased to 65 c.c. with safety. I have seen, and have personally injected, many cases of phthisis by this method, and I have never experienced any evil results whatever from its use. With some practice, one can become quite expert in putting the needle into the vein, but at first it presents some difficulty.

The rationale of the method consists in injecting into the vein such a quantity of an antiseptic fluid which shall reach the lung and so act on the micro-organisms causing the disease. I have only treated one case of bronchiectasis so far, *i.e.*, that of a virulent case which came into the hospital here under the care of Dr. Acland. I add a few notes of his case at the end of this paper (*see* Case F. L., No. 11). The dose of injection varied from 45 c.c. to 60 c.c. of 1 in 2000 solution. The injections were combined with creasote vapour baths. There was at first an increase in the amount of sputum, but later a decided diminution. The extremely foul odour of the sputum soon began to lessen, and to disappear entirely for one or two weeks at a time, and at the end of treatment was generally very much less. The temperature was generally lowered, became more regular, and not so remittent. The patient gained 10¾ lbs. during his stay in hospital (158 days), and his general condition was much improved, the patient himself being highly pleased with his progress. The physical signs on leaving were the same as on admission. One of the most marked effects was on the taste—the previous foul taste disappearing for a long period, and only returning towards the end of the course of treatment. These patients usually experience a foul taste in their mouths, which is a source of considerable discomfort, and relief from this was much appreciated by this patient. His stay in hospital, however, was suddenly cut short by having to be removed, owing to a maniacal fit, hich he had been subject to for a short time previously (cerebral abscess frontal lobe).[1]

He was sent to an infirmary, and recovered in about a week. The patient being extremely anxious that the treatment should be continued, so convinced was he of the benefit that it had done him, was re-admitted under Dr. Acland on 5th March 1902. His condition was much about the same as when he left hospital in December last. The physical signs showed no alteration, but the breath, however, was distinctly more fœtid, and the amount of sputum increased. It was then resolved to give him the formalin injections alone, without the creasote baths. After he had been injected on four occasions, his temperature began to rise, and he was thought to be suffering from an attack of broncho-pneumonia, with probably some gangrenous spread. The injections were stopped. He became rapidly emaciated, and his sputum became horribly fœtid. On the thirty-fifth day after admission he died.

The post-mortem examination showed the case to be one of marked cylindrical bronchiectasis in left lung, with some slight broncho-pneumonia in lower lobe of right lung. On examining the brain, an abscess about the size of a large walnut was found in the right frontal lobe.

The occasional occurrence of inverse types of temperature, both with creasote vapour baths alone, and also combined with formalin injections, is to be noted in this case.

It is, of course, impossible to give any definite opinion at present, as to the success or non-success of this method of treatment by formalin injections, but it is well worthy of a further trial.

Case J. W., No. 12, is an example of an extremely virulent case of bronchiectasis treated here by Dr. Maguire by this method. But as only seven injections could be given, it is impossible to judge of its effects.

As a result of my experience, I would say that the best results in the treatment of bronchiectasis are to be had from the combination of creasote vapour baths with subcutaneous injections of guaiacol in small doses (6 minims to 10 minims). Starting with this combination, I would give them once daily for the first few weeks, and during a period of at least a fortnight or three weeks

---

[1] Left hospital 23rd December 1901.

I should increase the frequency of the creasote vapour baths to two to three times daily, as the case may be, one daily injection only being given during this period; thereafter reverting for the remainder of the course of treatment to the initial doses. In most cases, to be of any decided value, the treatment must be continued for at least three to six months. In inveterate cases, I should be inclined to give a trial to the larger doses of the guaiacol (20 minims to 120 minims, according to its effects), in combination with the creasote vapour baths.

As for the intravenous formalin method, it is yet on its trial, and I can therefore express no opinion at present, but I trust that it will receive a fair trial, in the hope that it may be found of value in the treatment of this loathsome disease.

The following are some illustrative cases:—

Case 1.—C. C.) female), æt. 11 years and 7 months, suffering from bronchiectasis of the right lung. During a stay in hospital of forty-nine days, this patient was treated by the administration of creasote internally (1 minim to 2 minims, t.d.s.), and creasote vapour baths, with the following results: The general condition showed marked improvement, there being a gain in weight of 15 lb. The sputum completely disappeared. The physical signs in the lung showed very little change, if anything they were drier. The temperature was lowered.

Remarks.—Through the kindness of Dr. Percy Kidd, I had the privilege of examining this patient, about eight months after leaving hospital, both by the ordinary clinical methods and under the X-rays, and found no alteration in the physical signs in the lungs. She had no cough, no expectoration, and was attending school daily. This is an example of complete arrest of the disease.

Case 2.—G. S. (male), æt. 32, suffering from bronchiectasis of both lungs. During a stay in hospital of 164 days, this patient was treated by the intratracheal injections of guaiacol[1] and creasote vapour baths, with the following results: The patient's general condition showed improvement, there being a gain in weight of 9 lb.; the quantity of the sputum was much diminished, and its fœtor entirely disappeared. The physical signs in both lungs were somewhat drier in character.

Remarks.—Taking everything into consideration, this patient showed very distinct improvement.

Case 3.—J. H. (male), æt. 55, suffering from bronchiectasis of the right lung, with a suspicion of disease in the left lung. This patient, during a stay in hospital of 124 days, was treated by the subcutaneous injections of guaiacol and creasote vapour baths with the following results: There was a marked improvement in the general condition of the patient, with a gain in weight of 13¾ lb.; the weekly amount of sputum was reduced from 14 oz. to 3 oz., and its fœtor completely disappeared. The temperature showed a steady decline to its normal limits. The physical signs in the right lung were fewer in number, the left lung being quite free.

---

[1] Guaiacol, 2 parts; ol. olivæ, 88 parts; menthol, 10 parts. 1 drm. for a dose.

Remarks.—This is a case of complete arrest of the disease. At the present time he is in good health and is following his ordinary occupation.

Case. 4.—H. S. (male), æt. 17, suffering from bronchiectasis of both lungs. During a stay in hospital of 116 days, this patient was treated by the administration of creasote internally, creasote vapour baths and compressed air baths, with the following results: The patient's general condition showed marked improvement, there being a gain in weight of 26¼ lb.; the weekly amount of sputum was reduced from 34 oz. to 2 oz., and its fœtor entirely disappeared; the temperature underwent a steady reduction. The physical signs in both lungs remained *in statu quo.*

Remarks.—There was a marked improvement in this case, the compressed air baths seemed to improve the emphysematous condition of the lungs associated with the disease, and ought to be given a more frequent trial in emphysematous types of the disease.

Case 5.—W. K. (male), æt. 24, suffering from bronchiectasis of both lungs. During a stay in hospital of 135 days, this patient was treated by the daily administration of creasote vapour baths with the following results: The general condition of the patient showed improvement, there being a gain in weight of 12 lb.; the weekly amount of sputum was reduced from 100 oz. to 60 oz., and its fœtor became much less and at times disappeared for many days. There was a general lowering of the temperature. The physical signs in the lungs cleared up entirely.

Remarks.—This patient showed distinct improvement, the most marked feature of this case being the clearing up of the adventitious signs, a result which seldom occurs even in the most favourable cases.

Case 6.—J. C. (male), æt. 23, suffering from bronchiectasis of the left lung, with a suspicion of disease in the right lung. This patient was treated in hospital for a period of 102 days, by the administration of creasote internally and creasote vapour baths. One creasote vapour bath was given daily for five weeks, and then two for six weeks, with the following results: The general condition of the patient was much improved, there being a gain in weight of 2¾ lb.; the weekly amount of sputum increased from 56 oz. to 142 oz. as a result of the two daily creasote baths, but its fœtor became less. When those baths were stopped the weekly amount of sputum fell to 66 oz. The temperature was slightly lowered. The physical signs remained *in statu quo.*

Remarks.—This patient left hospital much improved in every way, in spite of the large amount of expectoration.

Case 7.—A. W. (female), æt. 33, suffering from chronic pneumonia with bronchiectasis of the right lung. This patient was under treatment in hospital for a period of 112 days, by the subcutaneous injections of guaiacol (1 in 5) 30 minims to 151 minims, and by creasote vapour baths, with the following results: The general condition of the patient showed marked improvement, until sudden death occurred, as previously recorded. The amount of sputum varied considerably, but its fœtor was diminished and sometimes disappeared for several days. The temperature was lowered. The physical signs remained *in statu quo*.

Remarks.—This inveterate case showed marked improvement as regards the general condition, and especially in the mental state, until sudden death occurred.

Case 8.—H. D. (male), æt. 29, suffering from bronchiectasis of the left lung. This patient was under treatment for 87 days, one to five creasote vapour baths being given daily, with the following results: The patient's general condition was improved, there being a gain in weight of 8½ lb. The effect of giving an increased number of baths daily was to decrease the amount of sputum considerably, but when one bath only was given daily the amount of sputum was considerably increased. When the daily bath was discontinued the weekly amount of sputum dropped from 95 oz. to 62 oz. The temperature was lowered and became more regular. The physical signs remained *in statu quo*.

Case 9.—J. W. (male), æt. 24, suffering from bronchiectasis of the right lung and broncho-pneumonia of the left lung. During a stay in hospital of 24 days, this patient was treated by creasote vapour baths, with the following results: The general condition showed no improvement, there being a gain in weight of only ¾ lb.; the weekly amount of the sputum increased from 124 oz. to 161 oz., and its fœtor still persisted. The physical signs in both lungs showed some spread; the temperature was slightly increased.

Remarks.—This case showed no improvement whatsoever, the broncho-pneumonic spread in the left lung contributing largely to this result.

Case 10.—D. F. (female), æt. 17, suffering from bronchiectasis of the right lung, with a suspicion of tuberculosis of the left lung. This patient remained in hospital for 20 weeks, and during 15¼ weeks of this period had no special treatment except rest in bed and good feeding. For the remaining 4¾ weeks, a creasote vapour bath was given daily, with the following results: The general condition of the patient was very much improved, there being a gain in weight of 15 lb.; the weekly amount of sputum decreased from 169 oz. to 61 oz., and its fœtor became very much less. The physical signs showed the right lung to be somewhat drier. The temperature was lowered.

Remarks.—It is interesting to note in this case the marked effects of rest only on the amount of sputum and the temperature without any special treatment.

Case 11.—F. L. (male), æt. 21, suffering from bronchiectasis of the left lung. During a period of 144 days, this patient was treated by means of intravenous injections of formalin (1 in 2000) 50 c.c. to 60 c.c., and creasote vapour baths, with the following results: The general condition showed improvement; the amount of the sputum was somewhat diminished and its fœtor became decidedly less, disappearing entirely for many days. The foul taste in the mouth previously experienced by the patient disappeared entirely for a long period. The temperature was slightly lowered. The physical signs in the left lung showed no change.

Remarks.—This patient was re-admitted into hospital a little over two months after the above treatment was discontinued. At his own special request he was again injected with the formalin solution (1 in 2000), but after four injections they were stopped. Some time after this he had an acute attack of broncho-pneumonia, which ended fatally.

Case 12.—J. W. (male), æt. 13, suffering from bronchiectasis of the right lung. This extremely virulent case was under treatment in hospital for 74 days. On admission it was decided to try intravenous injections of formalin (1 in 2000), but after six injections they were given up. The case ended fatally.

Case 13.—J. C. A. (male), æt. 23, suffering from tuberculous bronchiectasis of the right lung. During a period of thirty days in hospital, the patient for part of this time was treated by the daily administration of creasote vapour baths, with the following results: The general condition of the patient showed little or no improvement, although there was a gain in weight of 5 lb. During the administration of the daily creasote vapour bath the weekly amount of sputum increased from 38 oz. to 68 oz., and during the subsequent period of three weeks, when the vapour baths were stopped, the weekly amount of sputum varied from 61 oz. to 68 oz. The temperature was decidedly lowered as a result of the administration of these baths. The physical signs in the lungs remained *in statu quo.*

Remarks.—This patient did not do well under treatment by creasote vapour baths, and this result fully confirms one's experience of these intractable cases of tuberculous bronchiectasis.

Case 14.—W. S. (male), æt. 34, suffering from tuberculous bronchiectasis of both lungs. During a stay in hospital of 92 days, this patient was treated by means of creasote vapour baths almost daily for about ten weeks, with the following results: The general condition of the patient did not improve, although there was a gain in weight of 1 lb. Under the administration of one creasote vapour bath daily the quantity of sputum was much diminished, but after a time it increased steadily, but its fœtor became much less. At first the temperature showed a gradual decline, but subsequently it began to rise again. The physical signs in both lungs showed no alteration.

Remarks.—The disappointing results obtained in this case testify to the virulence of these tuberculous bronchiectasis cases.

VARIATION IN ITS RELATION TO THE ORIGIN OF INSANITY AND THE ALLIED NEUROSES.[1]

By John Macpherson, M.D., F.R.C.P.Ed., *Commissioner of Lunacy in Scotland.*

Lecture III.

The Neuroses.—1. The neuroses constitute variations from the normal, in respect of a hyper-excitability of the motor or sensory portions of the nervous system, which renders it susceptible to physical impressions and mental suggestion which do not affect normal persons.

---

[1] "The Morison Lectures," delivered before the Royal College of Physicians, Edinburgh.

2. Besides this nervous defect, there is also present a defect of metabolism of the nature of which we are at present ignorant.

3. They commence to manifest themselves in early life, childhood, or the adolescent period.

4. They all manifest a tendency to periodicity and impulsiveness.

5. They are all hereditary to a marked extent.

6. They tend, if they are not fatal, to subside in mature life and as the vital and sexual force becomes weaker.

7. While their incidence varies considerably in the individual, they have no geographical or racial limit, but affect all races of men and many of the higher animals.

Epilepsy.—Epilepsy is a variation characterised by convulsions or by sudden temporary impairment or loss of consciousness. It does not depend upon organic disease of the brain or upon reflex irritation of the nerves, although these may occasionally start it. It may, indeed, occur, as we have, seen in anencephalus or pseudocephalus monsters, and in the pithed frog, so that the cerebrum is not an essential part of the mechanism for its production. On the contrary, the cerebrum, so far as I can interpret physiological experiments, is the great inhibitor of convulsions. On the other hand, a downward discharging lesion from the cortex may start an epileptic seizure. Into the pathogeny of the affection it is not my intention here to enter. I have dealt with it at length in another place.[1] I may, however, briefly recall to your minds the suggestive experiments of Magnan, Horsley, and other authors: Magnan found that, by injecting one minim of absinthe into the veins of an animal, he was able to induce a true "idiopathic" epileptic seizure. This was amply confirmed by Horsley by means of many similar experiments. Since then numerous workers have directed their attention to the convulsant properties of the urine of epileptics, and Fère has demonstrated the presence of such a property. The researches of Haig of London and Krainski of Cracow are also, in this connection, full of interest and significance.

Epilepsy in all its forms and symptoms is met with in domestic animals, including fowls and birds. Friedenberger and Fröhner[2] divide the disease as it occurs in domestic animals into (1) True primitive idiopathic epilepsy, (2) symptomatic epilepsy, (3) traumatic epilepsy, and (4) reflex epilepsy. They also describe the minor forms (*petit mal*) and the graver forms of convulsion. They state: "It is observed at all ages and in animals of both sexes. In cows the disease ordinarily appears after the first calving; in oxen the initial attacks were seen after the first performance of work. During the periods which separate the fits, the animals show all symptoms of health; mental depression, cerebral troubles, dulness of the senses and of the intelligence are rare."

---

[1] "Mental Affections," p. 330.

[2] "Path. and Therapeut. of Domestic Animals," p. 138.

"Of all the diseases included in the group of the neuroses (says Hirsch),[1] none shows a prevalence so general in time and place as epilepsy, none is so constantly present in the morbid life of humanity, none has so markedly the ubiquitous character." It would appear to be uninfluenced by climate, or soil, or race, or habits, or geographical location. It is of the same type, and generally common among all the nationalities of Europe, in the Moorish population of Algiers, among the Mongols of Northern and Southern Asia, among Malays, Javanese, natives of Peru, and Indians of Brazil. In fact, so far as is known, no race in the world is exempt. Local differences undoubtedly exist in the prevalence of the disease. These are best obtained from the records of countries which have military conscription. In France, the number of conscripts sent back on account of epilepsy, from 1831 to 1853, was 6627 in a total of 4,036,372, or 1·6 per 1000; but, taking the period 1850 to 1869, it rises to 2·75 per 1000. In Italy, out of 2,333,288 recruits medically inspected in fifteen years, 5103, or 2·4 per 1000, were rejected on account of epilepsy. In Belgium the proportion was 0·90, and in five superior districts of Wurtemberg, 0·93. In the several provinces of France the proportion of epilepsy appears to vary irregularly from 0·5 to 3·4 per 1000. In Italy the distribution shows as a general rule that the disease predominates in the Southern and Western provinces in contrast to the North Eastern.

From these and other sources Hirsch estimates the average frequency of the disease in Central and Southern Europe at about 1·5 per 1000 inhabitants.

The number of epileptics among recruits does not represent by any means the extent of the neurosis in a population. We possess other means of appreciating though not of exactly estimating it numerically. The number of deaths from epilepsy and convulsions of children under five years in Scotland in 1900 was 1133. We find from the last census that the number of children living under five years at that time was 533,033, which gives a proportion of deaths from convulsions of 2·1 per 1000 living at that age. But a great many children do not die of convulsions; many live to grow up as epileptics; many have no recurrence of the malady until they are subjected to certain physical diseases, such as the exanthemata, the puerperal state of alcoholism; others have no recurrence throughout life; while others again, probably epileptigenous in their constitution, have no fits from birth until death. We have no reason, therefore, to doubt that the amount of epilepsy in Scotland is much less than the average of Europe, namely 1·5 per 1000 inhabitants.

---

[1] "Handbook of Geo. and Hist. Path.," vol. iii. p. 535.

Hysteria.—Hysteria is a purely psychical variation characterised by emotional excitement; it is frequently accompanied by hallucinations of sight and hearing; by peculiar convulsive muscular movements, and by hypnotic states during which the subject acts or speaks impulsively and involuntarily. The attacks are of short duration and are paroxysmal in their appearance. In susceptible subjects they may be produced at will by another person.

Catalepsy, which in the human subject is frequently an associated symptom of hysteria, is common in animals. It has been recognised in the ox, the dog, the horse, and the prairie wolf. According to Friedenberger and Fröhner,[1] the symptoms, which are analogous to hysteria in man, usually commence suddenly without any precursory indications; in some cases, however, there is anxiety, excitement, or loss of appetite. The animals are unable to make the slightest voluntary movement; they remain immobile — petrified — in the position in which the cataleptic attack has surprised them. Muscular resistance and rigidity are at first apparent, but these symptoms gradually pass off. Intelligence is more or less affected, and general sensitiveness is greatly diminished. The attacks may be repeated, and their duration is uncertain, lasting from a few minutes to a few hours. Balking in horses is no doubt often the result of temper, but there is a peculiar form of it which is thus described by Friedenberger and Fröhner:[2] "Some animals throw themselves on the ground and move their legs violently; others buck, rear, and may overthrow themselves backwards. Great excitement, with muscular trembling, is always observed; the eye is threatening, the heart beats tumultuously; the mucous membrane of the head injected, and the superficial veins greatly distended. In some cases balking is changed into veritable mania, and becomes marked by serious cerebral troubles. This phase of excitement is succeeded by a considerable depression of strength." Hysteria in the dog may assume extreme forms, and instances are known in which hysterical paresis occurred.

The symptoms of hysteria among primitive peoples are so inextricably mixed up with demoniacal possession, prophecy, and religious and medical practice, that it is not easy to dissociate them. It is, however, certain that the neurotic temperament, more especially if accompanied by convulsive or hysterical symptoms, is regarded as a valuable gift to be utilised for honourable and profitable purposes. This, I take it, is one of several reasons why there is a prevalent but erroneous belief that madness and nervous diseases are less common among savages than among civilised races. Did we regard the subjects of these affections as highly endowed and useful citizens, we could not be expected to class them among the diseased and degenerate. "Persons" (says Tylor[1]) "whose constitutional unsoundness induces morbid manifestations, are indeed marked out by nature to become seers and sorcerers. Among the Patagonians, patients seized with falling sickness or St. Vitus' dance are at once selected for magicians and soothsayers. Among Siberian tribes the Shamans select children liable to convulsions as suitable to be brought up to become hereditary members of the cult."

---

[1] *Loc. cit.*, p.151.

[2] *Loc. cit.*, p. 163.

Estimated by its universal diffusion over the world, and by the frequent references to it in the writings of travellers, lay and medical, hysteria must be the most common of all the neuroses. In the very oldest Brahminical writings, which precede by thousands of years the Christian era, mention is made of it among the diseases of the nervous system.[2] Coming down to modern times, we find it constantly referred to in the writings of travellers. Judging from the comparative frequency of these references, we can form the opinion that one of the principal seats of the malady is the group of countries in the arctic latitudes of the Eastern Hemisphere, including Iceland, the Faroe Islands, Lapland, and the parts of Europe and Asiatic Russia in the extreme north. From these regions we have information of the truly endemic prevalence of hysteria among the women of the Samoyeds, of the Yakuts, and other Siberian tribes, as well as among the inhabitants of Kamtschatka. It is also unusually common among the women of Samara and the Kirghiz Steppes. Although hysteria is common enough in Central Europe, it is less so than in the northern or the southern parts of the Continent, such as the south of Spain or Italy. Oppenheim, quoted by Hirsch, states that in Turkey it is "the heritage of women and the scourge of men."[3] It would appear to be less common among the Hindus and the natives of New Zealand, but it is not infrequently seen in Tahiti and the islands of Polynesia. Dr. Roser, quoted by Hirsch,[4] states that in Gnadenthal in South Africa there are few Hottentot women living there who do not suffer from hysteria in one form or another. The same appears to be true for the Abyssinian territory bordering on the Red Sea, for parts of Egypt, and for Tunis. On the tableland of Mexico hysteria counts among the commonest of diseases, and it is frequent in Costa Rica, Brazil, Chili, and Peru. Among the inhabitants of the Malay Peninsula, a peculiar manifestation of the disease, known as "latah," is very common. Dr. Ellis gives an excellent description of it in a paper.[5] "The symptoms in a latah subject can be suddenly aroused in many different ways, usually trivial in their nature, such as an unexpected noise, some sudden action on the part of a bystander, a sudden touch. or the mere mention of some word, usually the name of a wild animal, such as a tiger. The duration of the phenomena is variable, and may last from a few moments to half an hour or more. The sufferers from the disease are divided by Ellis into two classes—(1) Those in whom involuntary mimicry is the predominant symptom; and (2) those in whom the repetition of senseless or obscene words and the performance of some act of impulsive violence are the principal symptoms. Mr. Swettenham, in "Malay Sketches,"[1] gives several interesting descriptions of the influence of suggestion upon the subjects of this malady. He tells of one man who was made to believe that a roll of Calcutta matting was his wife; and of another man who, having climbed a cocoanut-tree, remained there for hours because some one had tied a piece of rattan round the stem and told him it was a snake. Latah is as old as the known history of the Malays. The sufferers are more frequently females than males, and though there are differences of opinion on the point, I believe it is generally held to be more common among young females. The disease is nearly always hereditary.

---

[1] "Primitive Culture," vol. ii. p. 132.

[2] "Wise Com. on Hindu System of Med.," p. 250.

[3] "Geograph. and Hist. Path.," vol. iii. p. 519.

[4] *Loc. cit.*, p. 521.

[5] *Journ. Ment. Sc.*, London, 1897, p. 33.

Among the Javanese, the Samoyeds, the Russians of the Province of Orel, and certain Mohammedan sects in Asia, there occurs a peculiar psychical disorder of the hysterical type. In its milder forms it shows itself in inarticulate sounds which the affected person gives forth whenever her eye encounters anything repugnant to her, or if she be teased about any such susceptibility. When the malady is more intensely developed, the woman breaks out into mania, throws her arms about her, or even turns her fury upon her own person, resuming the appearance of perfect sanity when the paroxysm is over. Running through all these endemic psychopathies is a striking resemblance to latah which almost forces one to the conclusion that they are all one and the same thing.

When we turn from endemic to epidemic hysteria, we open out an endless field which is quite beyond the scope of these lectures. A few references, however, must be made in order to complete the subject. In Madagascar, in the year 1864, a peculiar epidemic of hysteria occurred among girls and young married women from 15 to 25 years of age. The occasion of the outbreak, which began at one point and spread gradually almost over the whole island, was the profound sensation caused among the people by the violent death of the king and the consequent changes in the religion and laws. The morbid phenomena were almost identical with those of the dancing mania of the Middle Ages.[2] To mention even cursorily the successive occurrences of these psychopathic outbreaks in Europe during the last nineteen centuries, would unduly encroach upon the scope of the present lecture. They form by themselves a subject of extensive study in psychopathology. Those interested will find the subject adequately discussed in Hecker's "Epidemics of the Middle Ages."

---

[1] Quoted by Ellis, *loc. cit.*

[2] Hirsch, *loc. cit.*, p. 529.

Alcoholism.—I define the term as used here, as a variation characterised by an abnormal craving for artificial mental states produced by drugs, the commonest of which is alcohol. I have placed alcoholism among the neuroses for the following reasons:—(1) It is strongly hereditary; (2) it commences usually at the adolescent period of life; (3) the symptoms are paroxysmal and impulsive; (4) it is particularly common in persons of a neurotic stock, and is seen in association with insanity and the other neuroses; (5) its distribution throughout the human race is in accordance with what we know of the other neuroses; and (6) it is universally admitted that the fundamental explanation of alcoholic and other drug intoxication is not a physical desire of the sense of taste, but a craving for a mental state. It is this dissatisfaction with the existing mental state and the desire for another which is the basis of the outward manifestation of the neurosis.

1. The first point of resemblance between alcoholism and the neuroses is its heredity. When we talk of the hereditary tendency to inebriety, we mean, of course, that the peculiar constitution which craves after an artificial mental state is inherited. Now this peculiar mental constitution is not produced by the drinking habits of the parents, for, as we have seen, descent is through the germ cells alone. But during the tenancy of the germ cells in the parental body do they not receive such and such impressions? Probably they do, but to assert that these impressions are conveyed as definite-like propensities to a future individual is contrary to the latest knowledge of the subject. This craving for intense states of consciousness goes back as far as we can trace the history of the race, and it exists among primitive races at the present day. It would only be wasting time to recount the details of the generally accepted heredity of alcoholism, but it is an important fact to notice that the heredity is as often dissimilar as similar, that is to say, that alcoholics are closely related to every form of insanity, to the neuroses, and to many of the diathetic diseases. Legrain, the great French medical authority on alcoholism, says: "We find all forms of insanity present in the ancestors of drinkers—mental defect, hysteria, epilepsy, mania, melancholia, periodic insanity, general paralysis, brain softening, and apoplexy."[1]

2. The second point of resemblance is the age of onset. The accompanying table, which I have compiled from statistics in the writings of Parrish and Partridge, shows the age at which drinking habits were formed in 563 cases of inebriety:—

---

[1] Tuke's *Dict. of Pyschol. Med.*, Art. "Alcoholism."

Table I.—*Age at which drinking commenced in 563 cases of alcoholism.*

Years.	Cases.
Under 10	1
10—15	29
15—20	147
20—25	173
25—30	88
30—35	62
35—40	29
40—45	14
45—50	13
50—55	7
	563

Table II.—*Age of commencement of disease.*

Years	-10	-20	-30	-40	-50	-60
Epilepsy (Per cent.).	29	46	15·7	6	2	1
Hysteria ,, ,,	8	50	28	10	3	1
Alcoholism ,, ,,	0·17	31	46	16	4	1

These are most interesting tables, in that they show that the time for alcoholism to make its appearance is largely the period of life, 17 to 25, when the other neuroses attack the individual. Does it tend to pass off like them in maturer life? I believe it does, but unfortunately statistics on this point are awanting. In this connection Parrish says: "The terminal period comes with as much certainty as does its initial stage. That terminal period is the climacteric period. I am convinced that the allowance of twenty-five years of use will, in most cases, close the drinking career, either by the exhaustion of the desire, or by the fatal termination of the individual life. I think it will be found also, that when inebriates have lived beyond the middle period, so as to reach the three- or four-score limit, the commencement of the drinking habit was considerably later in life than the average period named."[1] Crothers, quoted by Partridge, says: "There are periods between 17 and 25, and from 30 to 40, in which the liability to contract the drink habit is greatest. This is most likely to die out between 45 and 50, or from 58 to 62. Mr. Hadley of the M'Cauley Mission in New York, says that most conversions of drunkards take place between the ages of 30 and 50. Dr. Brainthwaite says, " most of the cures take place between 30 and 45, though many cases do well older up to 55 or 60; the younger ones are most unsatisfactory; very few indeed succeed in getting right under 25 or 26." All the authors I have quoted from are men of vast experience in the treatment of inebriety. If they are right, how comes it if, as many maintain, the drink craving is largely due to the continued action of alcohol on the nerve cells producing moral degradation, that younger inebriates are less curable than the older?

---

[1] "Alcoholic Inebriety," p. 80.

3. The third bond of similarity between alcoholism and the neuroses to which I shall refer is its paroxysmal and impulsive character. However useful as a clinical distinction the division of alcoholism into dipsomania and ordinary inebriety may be, it is an unfortunate one for general purposes, and has tended to draw an artificial line of distinction between what is termed irresponsible and vicious drinking. All inebriety is impulsive, and, however short the intervals between indulgence, its essential character is paroxysmal. It is the confirmed habit which, for physical reasons, necessitates the repetition of the drug, which obscures the underlying impulse. Partridge argues[1] (I take him as the type of many others) as follows:—"With one or two exceptions, the testimony is that after a man has been without drink for a few days (10 days is the time mentioned in most cases) there is no longer a craving for alcohol. This is especially true when a man is so situated that liquor cannot be obtained" (in prison). But in another place he says,[2] speaking differentially of dipsomania as if it were a separate disease: "When alcohol cannot be obtained, there is restlessness, indefinable horror as of some impending danger, the throat is parched, the skin hot and dry, the pulse rate increased." A question of this kind must be considered on the broad facts and not from isolated illustrative cases. Let me recall the case of the "latah" subject who climbed a tree, and who refused to come down because some one tied a piece of rattan round the stem and suggested to him that it was a snake. The same Malay would probably ascend and descend scores of trees in the absence of an imparted suggestion. It is the same with the inebriate. When at large, a thousand sights, sounds, and associations suggest drink; when in prison, suggestion is wholly withdrawn. But he has no more ceased on that account to be an inebriate than the Malay who climbs trees has ceased to be "latah." There is, however, such a thing as auto-suggestion; it plays a powerful part in hysterical manifestations, and in that form of inebriety which clinicians call dipsomania. Now all suggestion, whether auto-suggestion, hypnotic suggestion, or hetero-suggestion, such as we are considering, is a form of obsession; the action proceeding from obsession is always impulsive, and the people who are the subjects of reiterated forms of suggestion, like the "latah" subject and the inebriate, are neurotic and abnormal apart from the suggestion and its results.

---

[1] *Am. Journ. Psychol.*, 1900, p. 338.

[2] *Loc. cit.*, p. 333.

4. This fact brings me to the fourth point of similarity between alcohol and the neuroses, the hereditary associations and the mental and physical confirmation of inebriates. We find many of the subjects of inebriety among the feeble-minded, among epileptics, hysterics, the insane, and the criminal classes; for the neuroses are not mutually exclusive and the appearance of more than one of them is not uncommon in the same individual. But it is very far from true that all the mentally defective, or neurotic, are the subject of the intoxication neurosis. The late Dr. Bruce Thomson, surgeon to the General Prison at Perth, said:[1] "The dipsomaniac murderers who have been sane from the date of their heinous deed astonish me much by their callousness and insensibility." Anstie says:[2] "An attentive study of the mental developments which are brought to our notice under various forms of narcotism, leads to the conclusion that there are a considerable number of persons born either with a distinct tendency to sensualism, or with a peculiar sensibility to certain external impressions which may remain unnoticed from the time of their passive reception, but are always liable to be revived. It is among such persons that the victims of narcotic excess are chiefly found." Mr. Thomas Holmes, missionary to the London police courts, and a recognised authority, says:[3] "I purpose showing the class of individuals the State has dubbed 'habitual inebriates.' Early in 1899 I took some trouble to ascertain the character of those who came within the Act of that year. I had my own long experience in London police courts to guide me. I found 80 per cent. of the women to be gross, homeless 'unfortunates,' not victims essentially of drink but of uncontrollable sensuality; 10 per cent. were garrulous old women from the workhouses, who had never possessed sound minds and on whom the smallest amount of alcohol produced strange and powerful effects; 10 per cent. only were decent women, and of these some were epileptics. I also found that a considerable number of the 80 per cent. were insane even as Tottie Fay and Jane Cakebread were insane. The men who came within the Act may be grouped into three classes—(1) Loafers, corner-men at public-houses, who never did any work except in prison, who were equally ready to rob a drunken man or assault a defenceless woman; (2) beggars, habitués of the shelter or cheap lodging-house; (3) men who live on the immorality of women. I could not find a decent male drunkard who came within the meaning of the Act."

Having, as I think, shown as conclusively as is possible that the victims of alcohol are variations from the normal type, I shall now glance as rapidly as possible at the sixth point, viz., the geographical distribution of this neurosis throughout the world. For obvious reasons, it is found only among mankind, and does not extend to the lower animals. Partridge says:[1] "Intoxication is one of the most important parts of the religious and social life of primitive man. The use of alcoholic beverages arose in connection with the religious social life in the effort to heighten the religious self-consciousness. Its use for these purposes among primitive people is widespread and almost universal." The use of alcohol and drugs can be traced directly from the worship of the ancient Aryans, who deified the goddess Soma in the form of wine down to the Dionysian worship of the Greeks and the later Bacchic ceremonies of the Romans.

---

[1] *Journ. Ment. Sc.*, London, October, 1870, p. 341.
[2] "Stimulants and Narcotics," p. 245.
[3] *Brit. Journ. Inebriety*, October, 1903.

All the records of travellers upon the domestic and social life of savages are unanimous as to the fact that every event out of the daily routine which causes people to assemble together is likely to be the occasion of intoxication. Birth alone is perhaps less associated with this form of enjoyment; marriages and deaths are certainly a very general excuse for intoxication. From Greenland to Cape Horn, and from China to Peru, intoxication is prevalent at deaths and burials; indeed, the uncivilised peoples who do not celebrate death in this way are probably exceptions, and it is remarkable that we still retain unmistakable survivals of the custom even in Western Europe.

"As drink gradually cheapened in this country, and came more and more within reach of the people, drunkenness waxed at a corresponding rate. The culminating point was reached early in the eighteenth century, when tavern signs intimated that customers could get drunk for a penny and dead drunk for twopence, and when gratuitous accommodation with clean straw to lie on was provided in the cellars for those who expended the twopence."[2] The progressive moral elevation of the people has not only changed this state of matters, but has by means of legislation rendered it impossible.

When we attempt, however, to compute the prevalence of alcoholism at the present day in Western Europe and America, we are faced with a very complicated problem. The published statistics would lead us to suppose that so far from improving we are getting worse. It should always be remembered that the tendency of vital statistics is to become not only more exact but more compendious. The statistics of the consumption of alcohol per head of the population is misleading, for much of it is wasted prodigally, and much is consumed by persons whom it is a misnomer to call inebriates. On the other hand, the police reports of convictions for drunkenness and disorder deal chiefly with a concentrated mass of moral and physical degeneracy, in which alcohol, though a secondary agency, plays, as might be anticipated, a dire and fatal rôle.

---

[1] *Am. Journ. Psych.*, April, 1900, p. 363.

[2] Samuelson quoted Archdall Reid, "Alcoholism," p. 106.

In the first lecture it was pointed out that the whole theory of variation fell under the mathematical theory of chance; starting from that point of view, I consider that I have proved—

1. That the variations discussed in the preceding lectures are constant, *i.e.* that they occur with more or less regularity among the different races of men.

2. That they show a universal distribution throughout mankind, and so far as that is possible among the higher animals.

3. That they are hereditary.

There remain, therefore, only three explanations of their occurrence, namely, (1) They are fortuitous or due to coincidence; (2) they are caused by the action of the environment; or (3) they are due to genetic variation.

Let us consider accident or fortuitous occurrence first. Suppose a population of 60,000,000 divided into 10,000,000 families, with six members in each family. Suppose an affection occurs constantly in one person per million; the odds against coincidence would be then considerable. But suppose that in one family one parent and two children were affected with this disorder, then on the basis of the theory of chance the odds against coincidence become no less than 8333 millions to one. We may therefore dismiss the possibility of accident or coincidence as an explanation.

With regard to environment, as it has been shown that the diseases and defects dealt with have no racial or geographical limit, and as the environment, therefore, is universal, this explanation may also be set aside as not admitting of rational discussion. There remains genetic variation, which accounts for mental defect and neuroses as it does for discrepancies in stature and in mental ability.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

La Pratique Dermatologique; Traité de dermatologie appliquée. Publié sous le direction de MM. Ernest Besnier, L. Brocq, L. Jacquet. Tome Quatrième. 213 figures en noir—25 planches en couleurs. Paris: Masson et Cie. 1904.

It speaks well for the energy of the editors that this great work, extending to almost four thousand pages quarto, with about nine hundred illustrations, has been completed within four years. Throughout a high level of merit has been maintained, and no apparent restriction has been placed on the length of the articles. Bodin opens with a carefully written account of diseases of the hair, but only certain are included, as many are treated of under other headings. Congenital absence of hair, canities, and hypertrichosis are dealt with. As to the influence which electrolysis is said to exert on the transformation of existing down into stronger hairs, Bodin expresses himself very positively. He says that it is real, especially in the case of females under 30, and "necessitates great reserve in such circumstances, for it may involve a long succession of séances and the destruction of the entire pilary system. After 30 the effect is no longer the same, and the electrolysis of some strong hairs in the middle of fine down is often without effect on their growth." It must be borne in mind, however, that when strong hairs develop on the faces of young women, the exciting cause acts powerfully, and, to form a fair decision, one would need to contrast one side which has been treated by electrolysis with the other which had been left alone. We are not aware that this test has ever been applied, and the mere fact that after electrolysis more lanugo hairs on the part have become stronger, and that this change goes on, is rather in favour of persistence of the source of stimulation within, than a reason for incriminating the operation for their removal.

No more exhaustive account of psoriasis has hitherto appeared than that presented by Audry, and if the secret of its pathogeny still eludes our grasp, it is not because all the available literature has not been subjected to minute scrutiny and elaborate analysis. A question which has much exercised investigators is whether the morbid process starts first in the epidermis or in the corium. Audry concludes that the initial lesion of psoriasis has its seat in the epithelium, the earliest appreciable phenomenon being the disappearance of the eleidin followed by a clumsy and incomplete keratinisation. The acanthosis is secondary. The intradermic lesions are primarily a dilatation of the venules of the papillæ, then later inflammatory alterations. Among these latter some depend alone on the epidermic changes in psoriasis, others respond to secondary infections. The symptomatology is fully elaborated, each step being illustrated by numerous figures. A special section is devoted to atypical forms, those often puzzling variants which lead to true psoriasis being dubbed something else. In the number of these will be found described, but not critically examined, the parapsoriases of Brocq. An interesting question finds place, namely, psoriasis of mucous surfaces. While most are mere casual extensions from affected skin in the neighbourhood, there are a few well-attested instances where the conjunctiva was involved. As to the arthropathies seen in psoriasis, which are much more common in France than with us, Audry regards these as not essential elements but complications, though special ones. After discussing in turn the various theories as to the nature of the disease, he affirms "that no one can become psoriatic but he who has brought with him at birth the needful predisposition, and who encounters, in course of events, parasites fitted to determine the appearance of active cutaneous lesions, while fundamental changes, dyscrasic or nervous, favour the outburst of the phenomena by weakening, after a continuous or paroxysmal fashion, the permanently enfeebled epidermis."

It might be thought that seborrhœa in the same able hands has in sixty pages enough space devoted to it, but there are so many primary and subsidiary problems to be elucidated, that even this space is not too ample, as those superadded morbid conditions which are here classed as seborrhœides are included. The over greasy state of the integument which, in its totality, constitutes seborrhœa, is not apparently due to one constant factor. With gaping and unduly active pilo-sebaceous follicles there is an excess of perspiration as well, while the intervening skin participates, is denser, has lost its tone, and may be congested or inflamed. There are variations in aspect, both as regards locality and also whether the part is thickly or sparingly covered with hair. Again, it differs with age, so that there is a characteristic infantile as well as a senile form. Audry points out that our knowledge of the fatty constituents of the normal skin is very hazy, so that when we come to speak of the disorders to which these are liable, nothing very definite can be said. But there is not purely a functional and physiological anomaly, there is an anatomical substratum. An oily hyperhydrosis plays a considerable part in the realisation of the greasy condition. Another point on which Audry expresses himself pretty distinctly is, that while seborrhœa exercises a temporary destructive effect on the hair, pronounced progressive alopecia cannot yet be wholly attributed to it, nor, on the other hand, does he think that the microbic origin of such baldness is at all proved. Of the seborrhœides there are two varieties chiefly prominent, pityriasis and what he calls the eczematising seborrhœide. Pityriasis or branny dandruff is not restricted to the scalp, though there most common and most conspicuous. This he views as a primitive and congenital epidermic anomaly, an original malformation of the scalp. On a seborrhœic basis a state resembling eczema may be grafted, and such surface may exude and crust, but it is premature to pronounce absolutely that this act of leeting is an essential part, one of the cardinal symptoms of the disease, or is a mere complication. He bears strong testimony to the value of sulphur in all of the unhealthy states alluded to above.

The task set before Jacquet of unravelling the disturbances of sensibility of the skin, is a tough one, and how difficult it is appears from his opening sentences. "This study is most complex. To be acquainted fully with its disorders, it is necessary to know primarily normal sensibility, its diverse phases, its precise organs, the sensitive terminals, its channels of conduction, its organs of reception and elaboration, and how these various species of apparatus work." Yet of much, if not all, of this our notions are rudimentary. Jacquet has struggled manfully with his subject; he has enforced his statements by many words and phrases in italics or in capital letters. Still, after reading over what he has said, with due attention to the emphasis, one carries away but a confused idea of the topic. His views on the two factors which go to occasion the eruption of the wheal in urticaria are well expressed, but these have already been long public property.

One of the most interesting chapters of the volume is that devoted to ringworm, which has been entrusted to the enthusiastic and capable hands of Sabouraud. He still separates the microsporum, which is the chief offender as regards ringworm of the scalp in children in Britain and in France, from trichophyton; as of the former there seems to be but one species, while there are many of the latter. As to the source of the fungus, he cites an observation of Matruchot, which, however, needs to be confirmed. He was led to inoculate an animal with an *eidamella* not spontaneously pathogenic, but depending solely on its resemblance botanically with fungi cultivated from ringworm; and with it he produced a characteristic ringworm. This supports the theory held for some time that ringworm originates from saprophytic moulds. Sabouraud has abandoned his opinion previously expressed, that tinea due to the trichophyton is more readily curable than that depending on the microsporum. He is strong on efforts being made to prevent the spread of the disease from an existing focus or foci to other fresh ones. He asserts this can be accomplished by epilating the still sound hairs round the patches on closely cropped heads, by painting thrice a week with fresh tincture of iodine diluted with three parts of alcohol, and twice a week rubbing in an ointment of pyrogallic acid and tar, which obviates some inconveniences arising from the iodine. For curative treatment he favours croton oil cautiously applied, and states that so employed a cure within six months can almost be promised. If one could be sure that this pretty severe remedy would be used with the precautions formulated and the exactitude he enforces, possibly this prognosis might not be far out, but this is assuming too much.

The term "tuberculides" has been invented to include a fairly numerous family of cutaneous disorders, which differ, it is true, much among themselves in aspect, localisation, and evolution, but which appear to have a close connection with tuberculosis. This group contains the lichen scrofulosorum of Hebra, which seems now to be satisfactorily proved to be a mild disseminate form of tuberculous infection. But when we come to acnitis and folliclis, terms which Barthélemy has devised, one finds one's self on less secure ground. Laffitte, who writes the article, has laboured to place before his readers a full description, but one fails on perusal to grasp his conception in its entirety. It is specially unfortunate that no coloured representation of what is meant to be conveyed by the letterpress is furnished for guidance. Duhring long since shadowed forth his conception of a large and small pustular scrofuloderm, and these names seem much more distinctive than those coined by Barthélemy, which recall too vividly an acne or a sycosis, from which they are apparently totally distinct and papulo-necrotic in character.

Rist has provided a very complete account of that too common ailment, the chronic ulcer of the lower part of the leg, but while the appearances and the causation are admirably worked out, the treatment is hardly as detailed and didactic as one might reasonably expect in a work of such magnitude. Zona, which brings the volume to a conclusion, is from the same pen, and the causation is very properly ascribed to epidemic influence, though the poison at work is still to be discovered.

Such a thesaurus for reference will hold its ground without rival for a long time, hence it appears to us unfortunate that a systematic index to the four volumes has not been appended. Even in a work arranged alphabetically, there are many subordinate headings which are not so arranged, and are hard to discover in the analytical table at the end. Its value would be immensely increased were such provided. This might easily be done still in a small supplementary volume.

W. ALLAN JAMIESON.

Mammalian Anatomy, with special reference to the Cat. By ALVIN DAVISON, Ph.D., Professor of Biology in Lafayette College. With over One Hundred Illustrations. London: Rebman Limited.

THIS little work seems to be based on the idea that the medical student would do better to study one animal type thoroughly, instead of wandering vaguely over the whole of the zoological kingdom. This work, therefore, introduces him in a most complete manner to the anatomy of the cat, and briefly points out the salient differences in the animal kingdom from the type selected. If this interpretation of the author's views be correct, and we think it is, we are not altogether inclined to differ from these views, for there is probably a good deal to be said for them.

The present work is lucid, thorough, and well illustrated, and seems to be admirably adapted to the function which we believe it is intended to fulfil. American orthography is always a little trying to British eyes, and the present work, with its rendering of "Esophagus," "center," "fiber," and kindred words, is no exception to the rule.

RICHARD J. A. BERRY.

A Text-Book of the Practice of Medicine. By JAMES M. ANDERS, M.D., Ph.D., LL.D. Philadelphia: W. B. Saunders & Co. 1903.

A STANDARD text-book of medicine which has reached its sixth edition may be expected to be a work of very considerable and undeniable merit; but when the volume is entirely, or almost entirely, from the pen of one author, one can hardly hope to find the same standard of merit maintained throughout. In the latest edition of Anders' text-book, the sections on the diseases of the nervous system and diseases due to animal parasites are the least satisfactory. It will suffice if one points out that no mention is made of the Achilles jerk in tabes dorsalis, or of the Babinski's sign in lateral sclerosis, that tapping is recommended as one of the modes of treating echinococcus cysts, that the author states that coccidia are readily found in the epithelial cells of carcinoma, and that embryonic filariæ are acquired through the drinking water. This part of the volume is in need of more thorough revision. Taken all in all, however, the volume presents its subject in a reliable and readable form, and it is a work one can say much in praise of. The clinical features of disease in its various forms are throughout delineated in a clear, accurate, and admirable style, the main points of differential diagnosis are frequently tabulated, therapeutics receives due attention, and formulæ for many prescriptions are found throughout the volume.

The sections on the infective and constitutional diseases, the diseases of the blood, ductless glands, respiratory, circulatory, alimentary, and urinary systems, leave little to be desired. One cannot, however, endorse the author's statement that, in incipient phthisis pulmonalis, defective expansion, increase of vocal fremitus, and impairment of percussion sound precede that most important auscultatory evidence, namely, prolongation of the expiratory murmur. No clear emphasis is laid on laryngeal tuberculosis as a complication of pulmonary phthisis, and in the section dealing with the general management of acute lobar pneumonia it would have been well had attention been directed to the danger the patient incurs from physical strain. Actinomycosis is the only form of streptothrix infection described, and in the discussion of the pathology of diabetes mellitus, one finds no reference to the pituitary. There are a few useful illustrations and a good subject index.

W. T. Ritchie.

Psychiatry: A Text-Book for Students and Practitioners. By Professor E. Kræpelin. Seventh Edition. Vol. II. Leipzig: J. A. Barth. 1904.

This is the second volume of the new edition of Professor Kræpelin's book, the first volume of which was recently under notice (March 1904). This volume is devoted to clinical psychiatry, and contains the classification of mental diseases which is now associated with Kræpelin's name. As his classification has many adherents in his own country, and has attracted much attention here, it may be of advantage to give a brief summary of it.

It is based on pathological, etiological, and clinical grounds, though he confesses that in none of these directions is our knowledge at all complete. This being so, and until our knowledge of them all is more complete, the clinical features are made the chief ground of distinction. In this field the whole course of a case is considered, and not the symptoms presented at any particular time. In this respect he follows Kahlbaum's lead. The following are his main groups, and their chief subdivisions:—

1. Insanity due to infectious diseases.
2. Insanity due to exhaustion—acute dementia, neurasthenia.

3. Insanity due to poisons—alcoholism, etc., myxœdema and cretinism, dementia præcox (?), general paralysis (?).
4. Insanity due to brain disease—tumour, chorea, late syphilis, arterio-sclerosis, abscess, hæmorrhage, traumatism.
5. Insanity of the period of regression.
6. Insanity due to defective organisation—Manio-depressive insanity, paranoia, epilepsy.
7. Insanity due to emotional disturbance—hysteria.
8. Insanity of the degenerate—imperative ideas, moral insanity, dipsomania, etc.
9. Insanity due to arrest of development—imbecility, idiocy.

He confesses that this is not a strictly scientific division, but it is as far as our present knowledge takes us, and he hopes it may lead to further improvement.

His descriptions of the various individual forms of insanity do not materially differ from those in the previous edition. It is seen that as before *dementia præcox* is subdivided into three varieties, hebephrenic, katatonic, and paranoiac. The first consists of cases in which there is a gradual development of more or less pronounced mental enfeeblement, with in some instances subacute, or occasionally acute, mental disturbance. This corresponds very much with what is known in this country as adolescent insanity. The katatonic form is seen in those who present characteristic symptoms of stupor ending in mental weakness, or of excitement, with phenomena of negativism, impulsiveness and perversity, stereotypy and suggestibility. In the last the symptoms take the form of a rapidly developing mental weakness with complete retention of memory, delusions, and usually hallucinations being the most prominent features.

The final chapter on imbecility and idiocy has undergone considerable revision, particular attention having been devoted to the most recent pathological investigations.

This text-book may be confidently recommended as the work of a careful observer and clear thinker, and, whether one agrees with him or not in his conclusions, the reading of it will prove instructive and suggestive. JAS. MIDDLEMASS.

NOTES ON BOOKS.

THE substance of Dr. Leslie Thorne Thorne's little work—*A Practical Guide to the Administration of the Nauheim Treatment of Chronic Disease of the Heart in England* (Baillière, London, 1904)—has already appeared in the pages of the *Lancet*, but it will be welcome to many in its present form. By following the directions furnished by the author, many patients who are unable to proceed to Nauheim may be given the benefit of the system of treatment carried out there at their own homes. Particular attention should be paid to the chapter on the selection of cases suitable for the treatment, lest discredit be brought on the method by its indiscriminate use.

A small work on *The Management of Lateral Curvature of the Spine and Stooping*, by E. Noble Smith, F.R.C.S. Edin. (Smith, Elder, & Co., London, 1904), contains the author's views on the value of exercises and massage in the treatment of spinal deviations. The importance of adapting the exercises to the variety and degree of deformity present in each individual case is strongly emphasised, and appropriate movements are suggested. A particularly useful exercise designed to counteract rotation is described. The value of Chance's splint is highly appraised by the author, and he has little difficulty in convincing us that it is superior both in principle and in practice to the cumbrous jackets so often employed. In the chapters on stooping some eminently sensible and useful remarks are made on the effect of badly shaped clothes in determining this deformity in growing children. The concluding section is devoted to a consideration of the value of mechanically expanding the chest in phthisis, and the employment of Chance's splint to this end is advocated. The author believes that there is a great future for this treatment of consumption.

We have received the twentieth annual issue of the *Year Book of the Scientific and Learned Societies of Great Britain and Ireland* (Charles Griffin & Co. Ltd.). This work has long since established itself as a standard book of reference, and of the present issue it is not necessary to say more than that it maintains the reputation made by its predecessors.

Burdett's Hospitals and Charities (The Scientific Press Ltd.) is a perfect mine of information on all subjects relating to hospitals, asylums, sanatoria, and other kindred institutions. It is gratifying to learn from the issue for 1904 that, in spite of the general depression in trade during 1903, "the Hospitals and Charities have been able to pursue their work without material diminution." In a general survey of the hospital problem in the metropolis, Sir Francis Burdett remarks that during recent years there has been a distinct diminution in the pressure on beds in certain departments, for example, in women's wards the decrease in eight years has been about 12 per cent.; in a like period the number of patients suffering from diseases of the skin has fallen by 10 per cent.; while in consumption hospitals there has been a decrease of 6 per cent. "These figures prove," in the judgment of the editor, "that where the hospital accommodation for the class of cases referred to is adequate to the needs of the population, the tendency must be to diminish considerably the amount of disease which affects the population in cities." With regard to paralysis, on the other hand, a startling increase has taken place; between 1893 and 1901 the increase was no less than 133 per cent.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,
MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

Recent Papers on Leucocythæmia.

The stereotyped text-book description of leucocythæmia as always either myelocytic or lymphocytic, is no longer upheld by most workers, and records of cases which depart from the standard type are rapidly increasing in number. The following notes will give an idea of the views now gaining ground.

Acute spleno-medullary leukæmia.—The occurrence of this type of leukæmia in an acute form may now be looked upon as positively settled. Among others, Billings and Capps (*Am. Journ. Med. Sc.*, Phila., 1903, September) report a case in a man, æt. 68, whose symptoms were in all respect characteristic, the total duration of the disease being about two months. The leucocytes numbered 540,000, with 43·2 per cent. of lymphocytes, 24 per cent. of polynuclears, 30·4 per cent. of myelocytes, 1·6 per cent. of eosinophiles, and 0·8 per cent of mast-cells. In later counts the proportion of myelocytes increased, while lymphocytes diminished. The writers emphasise the difficulty of distinguishing many of the large lymphocytes from myelocytes; their similarity indicates a close relationship between the two cells. Reviewing the literature, the writers distinguish between undoubted cases of acute myelocythæmia, six in number, and probable cases, two, the latter being Obraztow's oft-quoted instance of apparent infection (probably, however, these were lymphatic). Among the more important sources of error in diagnosis are—(1) Chronic myelocythæmia with an acute exacerbation. Here the history is a long-standing one, and the spleen is large, whereas in acute cases the organ is scarcely palpable in the early stages. (2) Lymphatic leukæmia complicated by an accidental leucocytosis. The appearance of neutrophiles gives an unusual picture, but myelocytes are few or absent. (3) Acute lymphatic leukæmia with predominance of large mononuclears. Absence of myelocytes is the guide here. (4) Acute infections causing rapid anæmia with myelocytes and nucleated reds. Here the leucocyte count is low, and the myelocytes fewer than in leukæmia. (5) An acute exacerbation of pernicious anæmia, in which a leucocytosis and myelocytes may appear in the blood. (6) Neoplasms involving the marrow giving rise to a blood change resembling leukæmia. Adverting to the similarity between the large mononuclears and myelocytes in their case, the authors suggest that, in practice, mononuclears showing even traces of granulation, and seen along with myelocytes of the same size, should be classed as myelocytes. In all recorded cases of acute myelæmia, the same difficulty in separating the two groups of cells has been noted.

Hirschfeld (*Folia hæmatologica*, 1904, March) reviews the published cases of atypical leukæmia. Acute myelocythæmia, as far as the half-dozen records go, shows more anæmia than the chronic form, slight or great leucocytosis, numerous myelocytes, normoblasts, and megaloblasts, no increase of eosinophiles or mast-cells, and usually a low percentage of lymphocytes. He next considers another series of cases, resembling chronic myelocythæmia, agreeing in having severe anæmia, low leucocyte counts, and no increase of eosinophiles or mast-cells. Can we, he asks, base a diagnosis of leukæmia on the presence of a large number of myelocytes alone? In all obscure cases the question of a tumour, with metastasis in the bones, arises. Discussing the groups of cases in which myelocytes appear in considerable number in lymphatic leukæmia, and in which lymphoid cells (Wollf) predominate, he inclines to the idea that the former are lymphocythæmias, in which the growth of the lymphatic tissue in the marrow stimulates that structure to produce an excess of granular cells, while the latter are really anomalous myelocythæmias. Cases of these groups do not justify the assumption that transitions between the two commonly accepted types of leukæmia occur.

Of aberrant cases of spleno-medullary leukæmia, Hirschfeld and Alexander's case (*Berl. klin. Wchnschr.*, 1902, No. 11) deserves mention. In addition to being acute, it had some unusual features. It began with stomatitis following removal of a tooth, and then anæmia developed. Not until a month had elapsed did the blood changes of leukæmia become manifest—leucocytosis of 30,000–40,000 with a normal proportion of lymphocytes and polynuclears, and about 8 per cent. of myelocytes, and many nucleated reds. The spleen enlarged, retinitis developed, and the case ran the usual course of an acute leukæmia, with multiple periostitis, terminating fatally in about six weeks from the onset. The diagnosis was confirmed post mortem. A noteworthy point was the absence of eosinophiles and mast-cells from the blood; even in the marrow the former were diminished and the latter absent. From the enormous numbers of Charcot-Leyden crystals found after death, the writers infer that eosinophile cells were abundant in the marrow in the early stages, but that their production soon ceased from exhaustion of the organ.

A somewhat analogous case is reported by Simon (*Am. Journ. Med. Sc.*, Phila., 1903, June), in which, throughout the whole course of a spleno-medullary leukæmia, there was complete absence of eosinophiles. The leucocyte count was also low (10,000–25,000, with 30 per cent. myelocytes) until near the end, when it rose to 116,000, the rise being mainly due to the presence of numbers of large lymphocytes. Post mortem examination confirmed the diagnosis, a fact of interest in relation to Ehrlich's statement that in carcinomatosis of the marrow with a blood-picture resembling leukæmia, the latter can be excluded by the absence of eosinophiles. In Simon's case, multiple myeloma was negatived by the absence of Bence Jones's albumose from the urine. The large mononuclears which appeared towards the end, corresponded with Wollf's lymphoid cells, and, though possibly related to myelocytes, were certainly not myelocytes which had lost their granules. Simon adopts Reed's classification of leukæmia (*v. infra*).

Wilkinson (*Lancet*, London, 1903, June 20) reports a case of *leukæmia with change of type in the appearance of the blood.* After the disease had lasted nearly a year, the blood was absolutely pathognomonic of advanced spleno-medullary leukæmia, the most striking feature being the enormous number of large myelocytes. The lymphocytes were also very numerous, there being every gradation between them and the myelocytes. Coincidently with an acute fatal exacerbation, the blood took on the picture of typical large-celled lymphatic leukæmia.

Reed (*Am. Journ. Med. Sc.*, Phila., 1892, vol. ii. p. 653), by a careful study of a case of *acute lymphatic leukæmia without glandular enlargement*, shows that the lymphocytosis arose from a proliferation of the lymphoid cells of the marrow, death occurring before any other organ was involved. The lymphoid tissue of marrow contains cells identical with, and is the organ of, the lymphocytes in the blood. As to the possible existence of an ancestral cell common to both erythrocytes and lymphocytes, Reed notes as suggestive a marked similarity between the normoblasts and small lymphocytes in her case. Acute leukæmia is certainly, and chronic lymphatic leukæmia probably, always myelogenous. Reed classifies leukæmia in three groups—myelocytic, lymphoid (lymphocytic), and mixed cell, *i.e.* cases diverging from either of the well-marked types.

Kelly, in an elaborate study of four cases of acute lymphatic leukæmia (*Univ. Penn. M. Bull.*, 1903, October), deals with the question of its myelogenous origin—the view now held by most authorities—in opposition to Ehrlich's teaching, that it arises in the lymphatic glands. After reviewing the matter in all its bearings, Kelly's conclusions are :—The symptoms and blood-picture of leukæmia justify its clinical division into lymphatic and myelogenous (spleno-medullary) varieties. Since, however, so-called lymphatic leukæmia occurs without alteration in the glands, and since the typical blood-picture does not develop until the marrow becomes affected, the latter is the primary lesion; both varieties, therefore, are of myelogenous origin, and are best called lymphocytic and myelocytic, to suggest the distinguishing feature of the bone-marrow proliferation. Although there are two forms of the disease, there is no sharp line of demarcation, and atypical and transitional forms occur. Evidence has recently accumulated to show that acute leukæmia may be myelocytic, while of lymphocytic cases chronic ones may have large lymphocytes and acute ones small lymphocytes. The blood-picture is a mirror of the existing marrow condition, and though some of the lymphocytes in the blood are probably formed in lymphoid structures elsewhere, it may well be doubted whether disease of the glands alone ever causes leukæmia. Proliferation in the bone-marrow is most likely due to chemiotaxis, *i.e.* the disease is always an active leucocytosis, and to differences in the chemiotactic agent differences in the course of the disease must be ascribed. The close relationship between the two clinical types is suggested not only by their myelogenous origin, but by the presence of granules in the lymphocytes, their power of amœboid movement, and the probable common ancestry of granulocytes and lymphocytes. The author tentatively suggests that the large non-granular mononuclear is the ancestral cell; it is, at least, genetically related to the large lymphocyte and myelocyte. Much of this paper is devoted to a review of the opinions of Ehrlich, Pappenheim, Wollf, and others, and may be commended as giving one of the clearest accounts in English of the very complicated issues between the two schools. It is, however, impossible to give an abstract of this part of his paper.

Miller and Hess (*Am. Med.*, Phila., 1904, March 5) record a case of acute large-celled lymphocythæmia, fatal from a hitherto unreported cause—rupture of the spleen. A good account of the disease, containing, however, no new facts, accompanies the clinical notes by way of commentary. Hamman (*ibid.*, January 23, 1904) describes the blood in acute leukæmia, of which three cases are described in detail. He has collected 124 cases from the literature, from which list thirteen are for various reasons excluded. Of the remaining 111, fifty-seven correspond with Frænckel's description (large lymphocytic type), twelve are of the small lymphocytic variety, seven are atypical, while in thirty-five the description is so meagre as to leave their nature uncertain. From a synopsis of the blood changes in the fifty-seven large lymphocytic cases, we learn that the highest number of nucleated reds was 4615 per c.mm.; megaloblasts may occur in small numbers; in some of the most marked cases nucleated reds were absent. The lowest leucocyte count was 20,000, the highest 958,000. The large lymphocytes predominate, but all transitions from large to small cells can be traced, and in many instances there is an approximation to the myelocyte type. Polynuclears and eosinophiles may be quite absent, myelocytes are often present in small numbers, but mast-cells are never observed. Hamman accepts a myelogenous origin for the large lymphocytes, as against Ehrlich's theory. He thinks leukæmia should be classified as myelocytic, small lymphocytic, and large lymphocytic (lymphoid cell). The characteristic clinical feature of the last-named group is acuteness, the course being chronic in only four recorded cases. Of the eleven cases of acute leukæmia referred to above as being of the small-celled type, only two were typical as regards their blood-picture. This form, therefore, seems as a rule to run a more chronic course. The concluding section of the paper is devoted to some of the rarer forms of acute leukæmia, myelocytic and intermediate, a note on transitions from one type to the other, and a reference to the blood in chloroma, which the author looks on as agreeing with that of lymphoid leukæmia. He concludes that every grade of transition occurs between the three forms mentioned; that acute leukæmia nearly always shows the blood-picture described by Frænckel, and that either of the other blood-pictures is an assurance that the disease will be chronic.

Other important papers are: Weber (*Virchow's Archiv*, 1903, Bd. clxxiv.), "Classification of Blood Diseases"; Dock (*Am. Journ. Med. Sc.*, Phila., 1904, April), "Influence of Complicating Diseases on Leukæmia"; Walz (*Centralbl. f. allg. Path. u. path. Anat.*, Jena, 1901, Bd. xii.), and Pratt (*Boston Med. and S. Journ.*, 1903, December 17 and 24), critical reviews of subject up to date.

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

LECTURER ON SURGERY, SCHOOL OF MEDICINE, EDINBURGH.

ON SO-CALLED SPONTANEOUS HÆMORRHAGE FROM THE PROSTATE.

MOTZ and Suarez (*Ann. d. mal. d. org. génito-urin.*, Paris, 1904, April 1) report the results of an elaborate study they have made on the subject of hæmorrhage from the prostate. They confine their attention to those cases in which the bleeding occurs apart from injury by instruments. From its anatomical arrangements the prostate is not likely to bleed, as it is not in direct contact with the urinary reservoir. That mere congestion of the gland does not lead to hæmaturia, seems evident from the fact that in cases of acute prostatitis, even when suppurative, there is practically never blood in the urine. In cancer and in tuberculosis of the gland, also, bleeding does not occur unless the disease encroaches on the vesical or the urethral mucous membrane. Further, although the normal prostate is a comparatively vascular organ, in its hypertrophied condition, and particularly when the enlargement is due to adenomatous masses in its substance, the vascularity is not great: witness the limited bleeding which accompanies excision of the gland. The dilated vessels are found chiefly towards the periphery. If spontaneous hæmorrhage occurs, it should be comparatively easy to find hæmorrhagic foci in the substance of enlarged prostates, but, after a careful macroscopic and microscopic examination of nearly 250 hypertrophied glands, the authors have found such intraprostatic foci only in two. In one case the hæmorrhage was encapsulated, in the other it had opened into the bladder. The vascular lesions in the two specimens were identical, and consisted in an enormous new formation of angiomatous tissue, followed by rupture of the walls of the newly-formed capillaries, and the production of large collections of blood and infiltration of the parenchyma of the gland. The authors express the opinion that hæmorrhage does not occur merely from congestion of an enlarged prostate, but that the hæmaturia, so often met with in these cases, is due to bleeding from other organs and particularly from the mucous membrane of the bladder and the posterior urethra. Less commonly the bleeding is from the kidney, the renal pelvis, and the ureter.

ON THE TREATMENT OF CHRONIC URETHRITIS.

CARIANI (*Ann. d. mal. d. org. génito-urin.*, Paris, 1904, April 1) contributes a paper in which he gives his experience of Motz's method of treating chronic urethritis. Before beginning to treat a case of chronic urethritis, it is necessary to determine, in the first place, whether or not the lesion is gonococcal; and, secondly, the state of the prostate gland. In many cases of rebellious urethritis, the persistence of the symptoms is due to the presence of small foci in the prostate, which constantly reinfect the urethra. In many cases, when the condition has lasted for a long time, the ordinary methods of examination of the prostate give little information, and it is only by microscopic examination of the prostatic secretion obtained by massage of the gland, after washing out the urethra, that the nature of the inflammation can be determined. In such cases, in addition to the general treatment of the patient, which includes the avoidance of all causes of prostatic congestion, such as indiscretions in diet, constipation, sexual excesses, the use of the bicycle, etc., local treatment of the prostatic condition is called for. This consists in performing massage of the organ every second day, combined with lavage of the urethra with potassium permanganate, or sublimate, and instillations of silver nitrate into the posterior urethra.

In addition to these rebellious forms, which are due to prostatic infection, there are cases in which the discharge is kept up by the thickening and keratinisation of the mucous membrane of the urethra and infiltration of the deep layers of the submucous and peri-urethral tissue. The density of the mucous membrane, and the depth of the infective foci from the surface, prevent ordinary antiseptic agents, introduced into the urethra, from acting on the inflammatory foci. Most urologists have recourse to dilatation to act on these deep foci. Motz recommends the use of antiseptic agents, such as hermophenyl and oxycyanide of mercury, which do not decompose when in contact with the tissues, and these should be left in the urethra for a considerable time. In addition, he employed prolonged dilatation of the urethra and massage of the foci of infiltration on the bougie. Cariani has treated on these lines twenty cases of chronic urethritis which have resisted other treatment. In all the cases, some of which had lasted for several years, a cure was effected within two months, the number of sittings varying from seven to thirty-one.

TRAUMATIC ASPHYXIA.

THE term traumatic asphyxia is applied to a condition which results from forcible compression of the thorax, so that breathing cannot take place for several minutes. The majority of cases prove fatal at once, but in a few instances the patient has recovered, and in these there is a striking discoloration of the face and neck which is characteristic. Beach and Cobb of Boston (*Ann. Surg.*, Phila., 1904, April) record a recent case, and give a summary of the cases previously reported, six in number. Their case was that of a man, æt. 36, who was caught and held in a moving freight elevator for a period of about five minutes. While being released his face became black, and blood ran from his nose and mouth, and his eyes protruded. In addition to ordinary signs of bruising about the body and limbs, his face, neck, and shoulders exhibited a most striking discoloration, which is admirably depicted in a chromo-lithograph which accompanies the paper. The face appeared to be dotted with countless spots, from black and reddish black to blue in colour, very close together, while between the spots were minute areas of apparently normal skin. The line of demarcation between the skin so discoloured and the normal skin of the chest was well marked. At the back of the neck, except within the confines of the trapezius muscles, there was no discoloration; a point which has not been noted in any other case. There were no retinal hæmorrhages observed on ophthalmoscopic examination. There was extensive ecchymosis under the conjunctiva, and the membrane bulged prominently. The special interest of this case is that the patient was accommodating enough to allow the authors to remove portions of the discoloured skin for microscopic examination, and that they have thus been able to settle a disputed point as to the cause of the discoloration. It has been generally held that the discoloration was due to numerous hæmorrhages into the skin, but their sections show that it is due to venous stasis from mechanical over-distension of the veins and capillaries, with or without paralysis from engorgement of, or pressure on, the sympathetic nerves. There was no sign of blood in the tissues outside the blood vessels. The limitation of the colour to the head and neck is attributed to the lack of valves in the jugular and facial veins.

It is interesting to note that in the case under consideration the discoloration disappeared rapidly after the third day, apparently simply fading out; "the areas of normal skin between the punctate colour spots became larger and wider, the general colour scheme turned from black to lead colour, to a slightly cloudy appearance of the skin, and three weeks afterwards the patient's face seemed almost normal, having only a slightly suffused appearance." The sub-conjunctival ecchymosis went through the usual chemiotactic changes seen in the absorption of a blood clot.

STRANGULATED HERNIA.

WEYPRECHT (*Arch. f. klin. Chir.*, Berlin, Bd. lxxi. Heft 1) reviews a series of 402 cases of strangulated hernia which have been treated in Körte's clinic in the last ten years. In seventy cases in which its use appeared justifiable, taxis was successfully employed, but in cases of small tightly strangulated herniæ, in cases where the strangulation had lasted for some time, and in cases where swelling of the overlying parts was present, no attempt at reduction by taxis was made. Six cases of reduction "en bloc" were met with, serving as a warning against the use of force in attempting reduction by taxis. In 254 of the cases operated on the gut was not gangrenous, and of these 91 per cent. recovered and 9 per cent. died. In seventy-three cases the gut was gangrenous, and of these 46 per cent. died. In 47 per cent. of the cases organisms were found in the fluid of the hernial sac, and it was found that actual gangrene of the wall of the gut is not necessary for the passage of organisms through it, though in all cases marked interference with the circulation must be present. Incarceration of a part of the circumference of the gut—Richter's hernia—was found in twenty-eight cases, and it is interesting to note that, while in many of these cases the symptoms were slight, in a third of them the incarcerated portion of gut was gangrenous. With the exception of the umbilical herniæ, none of the cases appeared to be of congenital origin. Femoral herniæ were found more frequently than inguinal, and were more often gangrenous. The majority of the cases were on the right side. As regards treatment, most cases were operated on under a general anæsthetic, and, as a rule, the constricting ring was divided from without inwards. When possible, radical cure was carried out. The best test for the viability of doubtful gut was found to be its reaction to hot water. The application of hot water should be followed by a contraction which spreads over the whole loop of strangulated intestine. In doubtful cases the loop was replaced, and a strip of iodoform gauze passed down to it. In many cases gangrenous looking constriction grooves were stitched over when the grooves did not pass completely round the gut, and the results were good in all the cases, no tendency to subsequent contraction being observed. When a groove extended all round the gut, resection was carried out. Of thirty-six cases of primary or secondary resection of gut, sixteen died. Fistulæ after resection were seen more frequently after circular union than after end to side or side to side union. The results were rather in favour of primary resection in doubtful cases as compared with the establishment of an artificial anus.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

F. W. N. HAULTAIN, M.D., F.R.C.P.Ed.,

PHYSICIAN FOR DISEASES OF WOMEN, DEACONESS HOSPITAL, EDINBURGH;

AND

J. A. C. KYNOCH, M.B., F.R.C.P.Ed.,

PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, ST. ANDREWS UNIVERSITY.

Cæsarean Section.

Olshausen (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 40) gives hypodermics of ergotin previous to operating. The uterus is brought out of the abdomen, and opened by a vertical incision in front or behind, so as to avoid the placenta. Olshausen does not think there is any advantage in Fritsch's fundal incision, nor does he admit that Palius' method of determining the seat of the placenta by the position of the round ligament is a certain one. More reliable is the outward bulging and network of veins on the uterine wall over the placental site; Olshausen recommends catgut, prepared in an alcoholic solution of carbolic for fifteen minutes. Of eighty cases performed in five years, sixty-six were for contracted pelvis, the remaining eighteen being for eclampsia, carcinoma uteri, nephritis, myoma, cardiac disease, vaginal stenosis, vaginal fixation of the uterus. The rate of mortality was 8 per cent. Olshausen considers Cæsarean section a better proceeding than high application of forceps, and superior to symphyseotomy.

Uterine Carcinoma and Vaginal Operation.

Flaischlen (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 52) gives the results of forty-eight vaginal operations for uterine carcinoma. Four patients died from the operation, three from intercurrent disease; seventeen remained free from recurrence for periods varying from seven to eighteen years, twenty remained free from recurrence for shorter periods. The proportion of permanent cures was 34 per cent. Of the recurrent cases sixteen died within two years, three in the third, five in the fourth. Flaischlen points out that success depends on early diagnosis, and that fairly satisfactory permanent results may be obtained by the vaginal operation.

VAGINAL TOTAL EXTIRPATION OF THE UTERUS FOR MYOMATA.

LEOPOLD (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 49) reports the results of 151 cases. In all, the condition of the circulatory system was ascertained prior to operation, and where there was marked anæmia, subcutaneous injections of saline solution were given. Leopold puts great importance on the general condition of the patient. The operation was limited to cases where the uterus did not exceed the size of a child's head. The rate of mortality was 3·7 per cent. The ligature method was used in all cases. Only in four cases was the permanent general condition unsatisfactory.

SARCOMATOUS TRANSFORMATION OF MYOMATA.

CULLEN (*Journ. Am. Med. Assoc.*, Chicago, 1903, October) states that myomata, showing sarcomatous change, are developed from connective tissue or the muscular tissue of the uterus. The tumours undergo rapid enlargements. He gives the following rules for operative interference:—(1) Pan-hysterectomy is absolutely necessary. (2) Bisection of the uterus is contra-indicated if there is anything pointing to malignant change. (3) In all cases of hysterectomy the uterus should be at once examined, and if malignancy be detected the cervix should at the same time be removed.

FIBROMATA OF THE ABDOMINAL WALL.

FALHNRICH (*Centralbl. f. Gynäk.*, Leipzig, 1903, No. 41) describes seven cases of this condition. Two originated in the anterior and one in the posterior sheath of the rectus, one in the superficial fascia, one from the internal oblique muscle, and two from the deep fascia. Falhnrich believes they originate as the result of rupture of the muscle from injury or infection, and that their growth is promoted by pregnancy.

SUPRAVAGINAL HYSTERECTOMY.

LAUWERS (*Bull. Soc. belge de gynéc. et d'obst.*, Bruxelles, 1904, No. 2) records 200 cases for fibromata, with a mortality of 3 per cent. The following complications were met with:—Cystic degeneration, eight cases; necrosis in four; infection, one; carcinoma of the body, two; sarcoma, three; intra-ligamentary growth, twelve; adhesions, ten; pregnancy, four; twisted pedicle, one; ascites, two; peritonitis, two.

The appendages were diseased in twenty-one cases. In forty-one cases there was extreme anæmia; complicated with jaundice, two; phthisis, two; albuminuria, four; paroxysmal tachycardia in one. The steps of his operation were as usual. After stitching the anterior and posterior lips of the cervical stump, he passes a continuous suture through the edges of the broad ligaments, drawing them over the stump, so as to bring all raw surfaces towards the pelvic floor.

THERAPEUTICS.

UNDER THE CHARGE OF

RALPH STOCKMAN, M.D., F.R.C.P.Ed.,

PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY;

AND

FRANCIS J. CHARTERIS, M.B.,

ASSISTANT TO THE PROFESSOR OF MATERIA MEDICA, GLASGOW UNIVERSITY.

SALIT.

THIS substance, prepared by von Heyden, is a salicylic ester of borneol. An oily fluid, it is insoluble in water and glycerin, but freely soluble in alcohol, ether, and oils. In the body it breaks up into borneol and salicylic acid. Therapeutically, salit is used mixed with equal parts of olive oil, either as a paint or rubbed on to the affected parts. In the former case, the part should be covered with gutta-percha tissue, in the latter with lint. After applying salit to the skin, salicylic acid can be detected in the urine.

Müller prefers rubbing in to mere painting. He employs from half to one teaspoonful of the olive oil mixture for each application, and as a rule uses it twice daily, representing from 2½ to 5 grms. of pure salit. He has been very favourably impressed with its effect in a series of thirty-six cases. It is especially good in muscular rheumatism, acute neuralgia, slight rheumatic arthritis, acute rheumatic pleurisy, and acute inflammation of the tendon sheaths. The results are comparable to those obtained with mesotan, also a salicyl ester, but the smell is much less marked, and is free from all trace of formaldehyde. It causes no unpleasant effect on the heart or other organs, but in a very small percentage of cases, salit, rubbed in, caused a slight but very itchy eczema. This was not confined to the part rubbed, but this was always the seat of maximum intensity.—*München. med. Wchnschr.*, 1904, No. 15.

INTRAVENOUS MEDICATION.

IN discussing the action of corrosive sublimate injections, Maragliano points out that there is no danger if proper precautions are taken. A large vein should be selected, and during the injection the vein should not be constricted so that the injected fluid may rapidly mix with the blood current. Use only very weak solutions, 1 in 5000 to 10,000, and never stronger than 1 in 1000. In this dilution sublimate causes no coagulation of the albumin of the blood. Even if a compound of mercury and albumin did form, it would redissolve in the excess of serum. The therapeutic action depends not on the bactericidal action, but on a true stimulation of the resisting powers of the organism. The agglutinating power of the serum increases. After injections of corrosive sublimate of $\frac{1}{10}$ mgrm. per kilo body weight, animals can resist the ordinary lethal dose of streptococci, diplococci, and anthrax bacilli. For rabbits the minimum lethal dose of corrosive sublimate is 15 mgrms. per kilo body weight.—*Gaz. d. osp.*, Milano, 1903, No. 125.

VENESECTION IN PNEUMONIA.

SCHANK thinks that venesection should be done scientifically. Pneumonic patients do not die from lack of lung through extensive hepatisation, or from the inability of the over-loaded heart to force the blood through the consolidated lung. They die from the toxæmia. Therefore venesection, to be of use, should not be done during the early stage, but later, when the patient is being overcome by the toxin. This may occur at any day of the disease. Here venesection removes part of the toxin. Simultaneously with the bleeding we should inject subcutaneously an amount of saline solution equal to the blood abstracted. By this means, part of the toxin is eliminated and the remaining part is diluted. In this way it may be possible to save a few cases which otherwise would end fatally.—*Therap. Gaz.*, Phila., 1904, March.

STOVAINE, A NEW LOCAL ANÆSTHETIC.

THIS substance belongs to the group of amino-alcohols. It is the hydrochloride of amyleine. By means of experiments on animals, de Lapersonne has been able to satisfy himself that the new body possesses distinct anæsthetic properties, while its toxicity is low. Thus a rabbit weighing 2450 kilos received in the space of two hours five intravenous injections, representing in all 25 c.c. of a 1 per cent. solution. The only effect was a slight nervous agitation and a little tetanic stiffness. The toxicity is decidedly less than that of cocaine. After having demonstrated its local anæsthetic action on the eye of the rabbit, de Lapersonne has used stovaine for various ophthalmic operations. Contrasting it with cocaine, he finds that as an instillation it is inferior to cocaine, but as a subcutaneous or subconjunctival injection it surpassed the action of cocaine. In the form of 4 per cent. solution in normal saline, stovaine has the following properties:—Almost always there is a disagreeable tingling, leading to reflex closure of the lids and lachrymation. In two minutes anæsthesia is complete, and the patient is ready for operation. The conjunctival vessels are injected. During the operation, cutting and manipulation of the cornea or extraction of the lens causes no discomfort, but iridectomy is painful. There is occasionally slight desquamation, but this does not interfere with the healing of the wound. For strabismus operations, subconjunctival injections are best; they should be preceded by instillations of cocaine or stovaine. Anæsthesia is complete in less than a minute, and lasts longer than with cocaine. The section of the tendon and insertion of stitches is not painful, but, as with cocaine, the exerting of tension on the muscular fibres is painful. The subconjunctival injection is followed by a chemosis of the size of a pea, while the vessels surrounding the chemosed area are intensely dilated. Finally, for instillation, a mixture of two parts of stovaine with one of cocaine can be employed. This affords complete anæsthesia without altering the tension or the vascularity of the conjunctiva.—*Presse méd.*, Paris, 1904, 13th April.

THEOCIN.

SUTER praises the diuretic action of theocin. It is more powerful than theobromin, and often acts when theobromin fails. The action of theocin is not permanent. It is very rapid and often phenomenal in its effect. In a short time, however, the quantity of urine begins to diminish, but for several days remains above the previous average. It seems best to give the drug intermittently only for a few days at a time. In the intervals, digitalis and alkaline diuretics can be used. Occasionally slight nausea and headache follows the use of the drug. It is best given in the form of solution, containing 7·5 to 15 grs. thrice daily. The effect is most marked in heart cases.—*Cor.-Bl. f. schweiz. Aerzte*, Basel, 1904, No. 7.

ACTION OF ALCOHOL AND GLYCERIN AS ANTIDOTES TO CARBOLIC ACID.

ASHER has investigated the antidotal action of glycerin and alcohol for carbolic acid. He shows that, on distilling a mixture of alcohol and carbolic acid, no chemical change has taken place. Similarly, by treating a solution of carbolic acid in glycerin with ether, he proves that no chemical change has taken place. His conclusion is that the antidotal action is not due to chemical change, since no alteration on the physical or chemical properties of the various factors is effected. Further, the antidotal action possessed by alcohol and glycerin depends largely on the degree of dilution.—*N. Y. Med. Journ.*, 1904, 16th April.

ERGOT IN TYPHOID FEVER.

LIVINGSTON recommends the hypodermic use of ergot in typhoid fever. He believes that it relieves congestion of the nervous system, stimulates the muscular coats of the intestine, thus preventing tympanitis, and by its action on the blood vessels it lessens the risk of hæmorrhage. Its chief action is relief of areas of vascular congestion; thus it supports the heart, by bringing about an equalisation of the blood distribution. The preparation employed is a solution of 1 drm. of the solid extract in 1 oz. of sterilised water. The solution is filtered, and then 2 minims of chloroform are added. The dose is 1 drm. given from two to six times in the day.—*N. Y. Med. Journ.*, 1904, 16th April.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

HARVEY LITTLEJOHN, M.A., B.Sc., M.B., F.R.C.S.Ed.,

LECTURER ON MEDICAL JURISPRUDENCE, SURGEONS' HALL, EDINBURGH.

SUDDEN DEATH.

LOCHTE has published a report upon the cases of sudden death amongst the bodies which were brought to the mortuary of the Hamburg Port Hospital during the years 1901 and 1902. There were 101 such cases, of which seventy-one were men and thirty women. The majority (over three-fourths) died in the street or at home. Two died in court, as a result in one case of subarachnoid hæmorrhage at the base of the brain, and in the other of rupture of the heart. In both of these, mental excitement in all probability was the exciting cause. In nine cases the death took place in public-houses, while in other three instances the person was found dead sitting on the water-closet, an occurrence which is by no means infrequent in connection with sudden death. The cause of death in one of these latter cases was peritonitis, in another alcoholism, while in the third the girl was an epileptic.

Classified according to age, the cases were distributed as follows:—

10 to 20 years of age	1
21 ,, 30 ,,	11
31 ,, 40 ,,	20
41 ,, 50 ,,	29
51 ,, 60 ,,	18
61 ,, 70 ,,	16

There were six persons over seventy years. A classification of the causes of death gave the following results:—

	Males.	Females
Heart diseases	25	6
Cerebral hæmorrhage	4	3
Diseases of lungs	5	3
Aneurysm and disease of arteries	3	4
Chronic alcoholism	20	5
Acute infectious diseases	11	1
Other causes	3	8
	71	30

Amongst the deaths from acute infectious diseases are included—one case of purulent pneumococcal meningitis, and one of erysipelas of the face, two cases of enteric fever, one of ulcerative endocarditis, and six of croupous pneumonia.—*Vrtljschr. f. gerichtl. Med.*, Berlin, Heft 1, 1904.

THE DIAGNOSIS OF DEATH FROM HÆMORRHAGE FROM THE POST-MORTEM APPEARANCES.

THE diagnosis of death from hæmorrhage is an easy matter, when a person is seen to lose a large quantity of blood or when a large effusion of blood is found in one of the body cavities at the post mortem examination. In the absence, however, of such evidence, as for example when a body is found with no wound or rupture of a large vessel, and where the surroundings do not indicate great loss of blood, the diagnosis is by no means so easy. Such circumstances may be present in the case of a woman dying after child-birth or abortion, and in connection with which there may be a criminal charge against a midwife or some other person. If all evidence of external hæmorrhage is removed, then considerable difficulty may be experienced in arriving at a conclusion as to the exact cause of death. Borntraeger and Berg studied the appearances presented in fifty cases of undoubted death from hæmorrhage arising from various causes, and as a result of their observations arrived at the following conclusions:—Total absence of post mortem lividity is rare. To the general emptiness of the veins of the body, those of the pia mater form an exception, having been found devoid of blood in only 6 per cent. of the cases, while in 84 per cent. they were moderately full, and in 10 per cent. markedly engorged. The most constant signs of death from hæmorrhage found in internal organs were, emptiness of the heart (72 per cent.), pallor of the parenchyma of the spleen (80 per cent.), and of the liver (84 per cent.). Great variation was found in the colour presented by the lungs and the kidneys, so that they afforded no definite indication of fatal loss of blood. In cases of internal hæmorrhage the average amount of blood effused was 1800 c.c., and this quantity may be regarded as sufficient to cause death. The least and largest amounts met with were 1500 c.c. and 3000 c.c. respectively, but both of these extremes are rare. On account of the gradual nature of the loss of blood in puerperal women, the resulting anæmia in the various organs is, as a rule, greater than usual, but the post mortem appearances are not so distinctive as to exclude the possibility of death having occurred from such causes as eclampsia, apoplexy, pulmonary embolism, and from embolism produced by the entrance of air into the veins. Almost complete emptiness of the blood vessels must not be regarded as a *conditio sine quâ non* in the diagnosis of death from hæmorrhage, more especially in those puerperal cases in which there is no other apparent cause of death.—*Vrtljschr. f. gerichtl. Med.*, Berlin, Heft 1, 1904.

ECZEMA AND SUDDEN DEATH IN CHILDREN.

FEER in the *Cor.-Bl. f. schweiz. Aerzte*, Basel, 1904, No. 1, publishes an interesting paper upon sudden death amongst children, in which, after dealing with the so-called "Thymus death," or the *status lymphaticus* as a cause of sudden death, he calls attention to a similar sudden and fatal result in children suffering from eczema and other skin diseases. The author has collected thirty cases in which young children suffering from eczema, but otherwise in apparent good health, have died suddenly. He has therefore come to the conclusion that the existence of an "Ekzemtod" or sudden death associated with eczema must be admitted, inasmuch as its frequency practically excludes acciaccidental coincidence and points to some definite relationship.

LIGHTNING STROKE AFFECTING A NUMBER OF PERSONS.

RIPPE records the effects produced by lightning upon twenty-three dragoons of a Russian regiment who were engaged in attending to their horses in a stable when it was struck by lightning. One man and a horse were killed outright; the remaining twenty-two men were more or less injured, but only seven required to be removed to hospital; the other fifteen being able to resume their duty on regaining consciousness about fifteen minutes after they were struck. The symptoms exhibited by all the patients, to a greater or less degree, were those of concussion of the brain, with dull aching in the head, accompanied by a sensation of noise and tingling in the ears. In one case there were convulsions, and in another delirium, which lasted for two days. Most of the patients showed an action upon the peripheral nervous system in the form of a paretic condition of one or more limbs, the lower extremities being most often affected. Many also suffered from anæsthesia or hyperæsthesia of portions of the skin. The majority exhibited characteristic arborescent markings upon the skin. The post mortem appearances in the fatal case of special importance were, marked hyperæmia of the brain and its membranes, together with an increased amount of fluid in the ventricles and cerebro-spinal space, hæmorrhages in the brain membranes, and a congested condition of the internal organs, espceially of the lungs, liver, and kidneys. The heart, on the other hand, contained little blood.—*St. Petersb. med. Wchnschr.*, No. 2, 1904.

A SIMPLE METHOD OF DISTINGUISHING HUMAN BLOOD FROM THAT OF OTHER MAMMALS.

MARX and Ehrenrooth call attention to a simple and easy method of distinguishing human blood from that of other mammals which may be of use in medico-legal cases. The principle of the method depends upon the recognition, by means of the microscope, of the action of homologous and heterologous sera upon fresh human blood. The red corpuscles of human blood become quickly agglutinated on the addition of an heterologous serum, whereas the addition of homologous serum scarcely produces any change or only very slight agglutination. This difference is at once recognised under the microscope. For example, human blood plus human blood serum produces merely a gradual approximation of the corpuscles to each other, which, however, remain distinct and recognisable; whereas human blood plus pig serum leads at once to a marked agglutination, in which the individual cells are not distinguishable. The action produced by heterologous serum is always accompanied by hæmolysis. The authors have tested their method on fluid (fresh and decomposed) blood as well as blood derived from stains of various ages and from different animals. The procedure in practice is as follows:—The blood, if dry, is dissolved in one or two drops of 0·6 per cent. salt solution, so as to obtain as concentrated a solution of blood as possible. A drop of this solution is placed upon a glass slide. By means of a sterile needle a drop of blood is then taken from the operator's own finger and mixed with the blood solution on the slide. Apply a cover-glass and examine under the microscope during the following quarter of an hour. The fresher the heterologous blood and the more concentrated the solution, the quicker will the reaction take place.—*München. med. Wchnschr.*, No. 7, 1904.

Poisoning by Potato Salad.

Dieudonné (*München. med. Wchnschr.*, 1903, No. 51) records an instance of wholesale poisoning after eating potato salad, in which 150 persons were affected. The symptoms produced were headache, giddiness, nausea, violent vomiting combined with collapse and colicky pain in the abdomen; many had cramp of the lower extremities, especially in the calves, and also a feeling of cold. The body temperature did not rise, the pulse was weak and slightly increased in frequency. The pupils reacted slowly, but otherwise showed no abnormal changes.

An examination of the potato salad proved the absence of any metallic poison, and also of an excessive quantity of solanin, only 0·021 gr. per kilo of this alkaloid being present. On bacteriological examination, however, an organism was discovered, which on culture proved to be *Proteus vulgaris*.

Mice and guinea-pigs remained healthy when bouillon cultures of this organism were injected subcutaneously or intraperitoneally. On the other hand, when they were fed on sterile potatoes, which had been infected, and kept for 18 to 24 hours, the animals died with symptoms of severe enteritis. A similar effect was produced by the potato salad itself, and it was apparent that the animals died as a result of a poison developed by the *Proteus vulgaris* in the potatoes.

The potatoes in question had been cooked some days before, and were subsequently peeled, cut into pieces, and placed over night in large baskets. The salad was prepared on the following forenoon, the day on which it was eaten. The weather was very hot. The author points out that in all probability many instances of wholesale poisoning after ingestion of potatoes are due to *Proteus* infection and not to the toxic action of solanin. Cases of meat poisoning due to the presence of *Proteus* have been recorded, but none, so far, in which potatoes have been implicated.

DISEASES OF THE EYE.

UNDER THE CHARGE OF
GEORGE A. BERRY, M.B., F.R.C.S.Ed.,
OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY;
AND
W. G. SYM, M.D., F.R.C.S.Ed.,
ASSISTANT OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY.

Chloroma.

An interesting example of this rare disease has recently been recorded by Cirincione (Genoa) and Calderaro (Sienna), who give the results of their investigations into what has always been a very difficult question in connection with the disease,—the origin, namely, of the green or greenish yellow colour. Their patient was a boy of 15, whose first symptom was pain about the left trochanter and thigh, then it "flew" to the left temporal fossa, and he lost hearing on that side. The left eye then began to protrude, and presently was standing out of his head "like an orange," when a mass of firm tissue could be felt behind it. The right eye presently followed suit; and though, after incision, the swelling went down, the patient died delirious and with a high temperature. Their account of the autopsy is most painstaking. In a number of situations, *e.g.*, the left inferior petrosal sinus, there were flat greenish purulent areas; there were fifteen of these patches on the inner face of the cranium, where the wall was eroded. The neoplasm in each orbit had a firm, almost a cartilaginous consistency, enlarged glands extended all the way down the neck. There were purulent areas in many situations, —a number, for example, about the size of a cherry-stone, in the substance of the temporal muscle, and about the elbow. There was a large new growth projecting into the pelvis from the sacrum. On microscopic examination, the basis of the tumour was found to be composed of interlacing fibrils, with masses of cells in the meshes. Where the parts were growing the capillaries were very numerous; little islets of new growth were found in the tissues, quite outside the main tumours. To determine the source of the pigment, which has been attributed both to bile pigments and to blood products, the authors made several experiments. They concluded that it did not come from blood, because water in which portions of the tumour had been soaked showed no absorption bands when examined with the spectroscope, and when sulphide of ammonium was added to the solution no alteration took place. They immersed a portion of tumour tissue in chloroform, which dissolved out the colouring matter, and when to this fluid they added absolute alcohol with ammonia, and then an alcoholic solution of chloride of zinc, no fluorescence occurred, and examination with the spectroscope was again negative. They therefore were of opinion that the pigment was not of biliary origin. In the area in which the green colour was most intense, namely, in the sacral tumour, there were numerous foci of microbes, and the authors suggest that it is owing to their presence that the colour develops. It is quite true that when they injected cultures of the organisms into the guinea-pig no development of tinting took place, but there are other chromogenic bacteria which differ in this respect according to the soil in which they are planted, and it may quite well be that there is some peculiarity in the tissue of this tumour which permits the development of colouring matter. As regards the growths themselves, the authors do not see the necessity of making a separate class. According to them, "chloroma" is a sarcoma in which "accidental" organisms have produced an unusual coloration.—*La Clin. ocul.*, Sienna, 1903, September to November.

OPTIC NEURITIS IN THE COURSE OF ACUTE INFECTIOUS DISEASES.

To a French journal Antonelli has communicated a series of papers dealing with this subject, in which he expresses the view that every or nearly every infectious disease is capable of producing neuritis, not only by way of intracranial or orbital disease, but also by the direct influence of the toxin upon the nerve itself. The optic nerve is not merely liable to inflammation, complicating local affections, such as sinusitis, but inasmuch as it possesses its own lymph sheath, it is subjected to risk of infection from toxins circulating through the system. After a preliminary discussion of the question as indicated above, and remarks upon the ophthalmoscopic changes, which may here be omitted, Antonelli takes up the various exanthemata individually, and mentions cases of neuritis which he or others have observed in the course of them. In influenza it is far from uncommon; in typhoid fever about twenty cases have been published; and an example has been recorded of a boy, born with congenital optic neuritis and choroido-retinitis, whose mother had passed through an attack of enteric fever when about five months pregnant of him. Malaria, diphtheria, measles, mumps, scarlatina, variola, even varicella, have all furnished cases. In syphilis, omitting cases secondary to gumma cerebri or periostitis, three types are distinguished,—(*a*) a papillitis, which sometimes occurs as a late secondary symptom in senile or malignant syphilis; (*b*) a chronic or subacute form of retrobulbar neuritis occurring in the tertiary stages, when the disease has not been efficiently treated earlier in its course; (*c*) a form which occurs during infancy in congenitally syphilitic children.—*Arch. d'opht.*, Paris, 1903, July to October.

Eye Symptoms in Rheumatoid Arthritis.

Before the Ophthalmological Society, Beaumont (Bath) recently read a paper on this subject. He considers that the origin of the disease in a pathological condition of the nervous system, is indicated, or at least suggested, by the eye symptoms. Transitory paralyses of the external ocular muscles are common: slight ptosis, for example, will appear in one eye, pass away, and return in the other. The iris, he thinks, is apt to be more unstable than in the healthy, approaching a condition of hippus, while sometimes the sensitiveness of the conjunctiva and cornea is greatly lowered. Concentric contraction of the field of vision is perhaps the symptom most frequently present; he thinks it not improbable that between the conditions of rheumatoid arthritis and of hysteria, the state of the fields may indicate a relation in this way, that the alteration in the fields in both these conditions is very similar in character, and both are believed to be of vasomotor origin, or at all events both exhibit vasomotor phenomena. Scotomata are rare if they occur, and apparently this contraction of the fields is not due to commencing atrophy, for there is no pallor of the disc, and the case does not go on to blindness. He regards the condition of the fields as to some extent analogous to the local "syncope" of Raynaud's disease, a failure in peripheral circulation, and finds that nitrate of amyl in some of his cases caused the contracted field to enlarge somewhat.—*Ophth. Rev.*, London, 1903, March.

REPORTS OF THE MEDICAL SOCIETIES.

◆

Edinburgh Medico-Chirurgical Society.—*May* 3, 1904.—Professor **Chiene**, C.B., President, in the chair.—Mr. **Cotterill** showed—(1) Giantism of foot; (2) osteoma of frontal sinus, causing necrosis of frontal bone and abscess in the frontal lobe of the brain; (3) bilateral tuberculous disease of the testis; castration on one side, removal of focus from epididymis on the other.—Mr. **Scot Skirving** showed an unusually large horn growing from the ear of a woman.—Mr. J. W. **Struthers** showed—(1) Bones from a recent case of fracture of the lower ends of the tibia and fibula; (2) prostate gland of unusual size removed suprapubically; (3) bladder and prostate, showing marked enlargement of the prostate.—Mr. **Alexis Thomson** showed two prostates removed by suprapubic operation.—Mr. **Robert Jones** (of Liverpool) read a paper entitled "Clinical Notes on Tuberculous Arthritis in the Young," which will appear in an early number of the Journal.

Clinical Meeting, *May* 18.—Professor **Chiene**, President, in the chair.—Dr. **Burn Murdoch** showed—(1) Infantile scurvy; (2) rheumatic nodules; (3) two nervous cases, probably cerebral tumour.—Mr. **Stiles** showed—(1) Child with congenital elevation of scapula; (2) boy after cuneiform osteotomy of femur for coxa vara; (3) girl after operation for unusually large hydatid cyst of liver; (4) child, æt. 2¼ years, four months after excision of large sarcoma of kidney; (5) child after arthrodesis of ankle and knee for infantile paralysis; (6) girl after second operation for ununited fracture of humerus.—Dr. **John Thomson** showed—(1) A peculiar congenital deformity of the frontal, nasal, and superior maxillary bones (rhinodyme) in the imbecile child of a mentally defective woman; (2) a case of congenital cerebellar ataxia of the type described by Dr. F. E. Batten.—Mr. H. J. **Stiles** and Dr. **John Thomson** showed three cases of congenital hypertrophy of the pylorus after operation (one after Loreta's operation, one after gastro-enterostomy, and one in which gastro-enterostomy was successful after Loreta's operation had failed).—Dr. **Fowler** showed—(1) A case of dwarfed growth in a child of eight and a half, showing some of the symptoms of cretinism, and probably due to thyroid inadequacy (*myxœdema fruste*); (2) a case of general spastic rigidity with a low grade of idiocy, and very severe rachitic deformity.—Dr. **Drummond** showed a case of microcephalus.—Mr. **Scott Carmichael** showed a congenital malformation of the bones of the forearm.

Card Specimens, and Photographs.—Dr. **Burn Murdoch** showed photographs of a remarkably interesting case of deformity, double congenital dislocation of the hip, and a rare condition of both knees, the external condyles of the femora being undeveloped and the patellæ absent.—Mr. **Stiles** showed—(1) Small round-celled sarcoma of upper half of femur; (2) large hydrocephalic head; (3) hydatid cyst of liver; (4) gold brooch recovered from œsophagus of infant by median œsophagotomy; (5) large sarcoma of kidney, and microscopical specimen.—Dr. **Fowler** showed specimens and drawings of blood from a mixed-celled leucocythæmia in a child—excess of large lymphocytes and myelocytes.—Mr. **Scott Carmichael** showed—(1) Congenital absence of first and second parts of rectum, with sac-like dilatation of descending and sigmoid colon; (2) necrosis of os calcis, result of septic wound of foot; (3) recent ileo-colic intussusception.—Dr. **John Thomson** showed—(1) Bones of lower limb from case of infantile scurvy (Barlow's disease); (2) diplococci from case of posterior-basic meningitis; (3) photographs and drawings of rheumatic nodules in various positions.

Edinburgh Obstetrical Society.—*May* 11, 1904.—Dr. **Brewis**, President, in the chair.—**Specimens** were shown by the **President**, Drs. **Barbour, Simpson, Fordyce,** and **Haultain.** Professor **Simpson** showed the Commemoration Plaque of the Fiftieth Anniversary of the Foundation of the Obstetrical Society, Leipzig.

Communications.—Dr. **Haultain** read a paper on "Malignant Uterine Complications of Fibro-myomata." The question was, "Do fibro-myomata influence or predispose to malignant uterine changes?" And this he considered from the following standpoints:—(1) Malignant degeneration of fibro-myomata; (2) associated malignant disease of mucosa—(*a*) Corporeal; (*b*) cervical. From his own statistics, Dr. Haultain found a slight tendency to increased frequency in the former, but probably the reverse in the latter; (3) malignant degeneration of cervical stump after subtotal hysterectomy. This was discussed from the point of view of subtotal *v.* pan-hysterectomy. Dr. Haultain concluded that a general review of the subject would appear to show that malignant uterine disease is but slightly affected by fibro-myomata, and their association is a pure coincidence. Thus, from this aspect, radical operative measures for the treatment of fibroids without symptoms could not be urged.—Dr. J. W. **Ballantyne** read a paper on "The Obstetric Satchel: a Problem in Asepsis." He pointed out the possible danger in present everyday practice that resided in the midwifery bag, and gave a short retrospect of the development of modern antiseptic and aseptic obstetrics. He referred to the anomalous contrast between the precautions adopted in an abdominal section and those in use in an ordinary confinement case.

Glasgow Medico-Chirurgical Society.—*May* 13, 1904.—Dr. **Robert Kennedy** showed—(*a*) A cretin from whom he removed a prolapsed rectum, sigmoid flexure and descending colon. The patient, a male, æt. 28, was admitted to hospital on the 2nd January 1904, in a state of collapse, but with no symptoms of obstruction. From the anus projected a huge mass of bowel, very congested and with patches of superficial gangrene. As the taxis was unsuccessful, the whole mass was cut away. About an inch of the lower end of the rectum was left so as to preserve the sphincter. The anus is now firmly contracted. (*b*) A case of large abscess of the brain cured by operation. (*c*) A case which presented a sinus which traversed the cranium completely, and contained some portions of a straw hat carried into the brain by means of a spike. The patient, a boy, æt. 3½, was admitted to hospital on 31st December 1901. Three months before, he had fallen on an iron spike which entered the head above the ear. The symptoms at the time were trifling, and the child was going about in a few days, but the sinus was left discharging pus. On admission, the patient was vomiting and drowsy, and complained of headache. When the sinus was opened up, a hole in the skull was found which admitted the tip of the finger. A probe could be passed along this sinus till it touched the skull on the opposite side. Pieces of straw were removed from the sinus, which must have traversed the temporo-sphenoidal lobe. Recovery was complete. (*d*) A case of traumatic intracranial arterio-venous aneurysm of the internal carotid artery and cavernous sinus (*exophthalmos pulsans*) cured by ligature of the common carotid artery. (*e*) A case of double mastoid operation with reference to restoration of hearing power. Before operation a watch had to be placed against the auricle before it could be heard. After operation the watch was heard at 13 inches on the right side and at 14 inches on the left side.—Dr. **Leslie Buchanan** read a short paper on "Mycoses with special reference to mycosis of the eyeball." Infection arose through injury from some object connected with agriculture. Necrosis of a definite area occurred, surrounded by an acute inflammatory ring. The result was an ulcer, which after six to ten days showed its peculiar characteristics. The floor of the ulcer was raised above the surrounding cornea. There was little pain and not much discharge. The disease tended to recovery by separation of the necrotic area and gradual cicatrisation.

Glasgow Pathological and Clinical Society.—*May* 9, 1904.—The President, Mr. A. E. **Maylard**, in the chair.—Dr. G. B. **Buchanan** showed the sac and coverings of an umbilical hernia, with omentum adherent round a large part of the wall, from a patient of 71 years of age, operated on for strangulated hernia.—Dr. **Alex. Napier** showed a patient, the subject of very extensive lupus verrucosus, who was under treatment by curetting, actual cautery, and injections of tuberculin: there had been marked improvement since this was commenced.—Dr. G. B. **Buchanan** showed a specimen of epithelioma of the œsophagus which had penetrated into the larynx.—Dr. **Napier** read notes of a case of acromegaly in a woman of 34.—Dr. J. **Wainman Findlay** read notes of a case of chronic lymphatic leukæmia, and demonstrated the condition of the blood.—Dr. K. T. **Monro** and J. **Archd. Campbell** reported a case of splenic abscess and empyema due to the bacillus typhosus, and associated with a positive Widal's reaction, but without intestinal lesion. Except fever, the case showed none of the signs of enteric. It terminated fatally in about three weeks.—Mr. R. H. **Parry** showed a case illustrating Brophy's operation for cleft palate.

INDEX.

PAGE
ABDOMINAL INCISIONS . . . 174
,, and Pelvic Surgery, by RUTHERFORD MORISON 21
,, Symptom-Complex . 166
,, Wall, Fibromata of the 556
Accommodation, Mechanism of . 278
Acne, Hypertrophic, of the Nose and its Surgical Treatment . 373
Adipocere, Case of Transformation of the Entire Body into . . 181
Adnexa and Pelvic Connective Tissue, Treatment of Suppurative Disease of the . . . 173
Agglutinins acting upon the Flagella and upon the Body of Bacteria, Non-identity of . . 84
Albumin, Subcutaneous Administration of 465
Alexines, Origin and Nature of . 81
Allchin, W. H., Manual of Medicine, Vol. V. *Review* . . 161
Anders, J. M., Text-Book of the Practice of Medicine. *Review* . 544
Aniline, Poisoning by . . . 178
Anti-Malarial Operations, Effect of 471
Antistreptococcic Serum, Polyvalence of 277
Arterial Degeneration, by GUTHRIE RANKIN 402
Arthrodesis of the Shoulder Joint. 267
Asphyxia, Traumatic . . . 553
Atrophic Rhinitis, Treatment of, by Injections of Paraffin . . 473
Atropine Intoxication . . . 467

BACILLUS of the Rat resembling that of Plague 468
Ballachulish Dispute . . . 105
Banded Krait, Some Observations on the Poison of the . . . 470
Bayliss *v.* Coleridge . . . 4
Bennett's Fracture of the Base of the Metacarpal Bone of the Thumb, by A. MILES and J. W. STRUTHERS 297

PAGE
Berry, R. J. A., Mammalian Anatomy, with special reference to the Cat, by A. Davison. *Review* 544
Besnier, Brocq et Jacquet, La Pratique Dermatologique. *Review* 541
Blindness, Bilateral, following Measles 280
Blood, Simple Method of Distinguishing Human, from that of other Mammals . . . 562
Blood Vessels, Effects of Suprarenal Capsule on . . . 78
"Bone Cysts" in the Accessory Sinuses of the Nose, Contribution to the Pathology of, by A. L. TURNER 47
Bone, Origin of Inflammatory Foci in, and their Relation to the Branching of the Arteries supplying the Marrow . . . 458
Bossi's Reply to Duhrssen's Criticism of his Dilator . . . 77
Brain Loss, Extensive, without Impairment of Intellectual Faculties . . 180
,, Surgery of Tumours of the . 459
Bramwell, J. M., Hypnotism: its History, Practice, and Theory. *Review* 355
Breast, Cancer of the . . . 73
,, Carcinoma of the, treated with Massive Mercuric Cataphoresis . . 467
Bronchiectasis, The Treatment of, by D. BARTY KING . . . 519

CÆSAREAN Section . . . 555
,, for Contracted Pelvis, A Case of, by J. A. C. KYNOCH . . . 448
Campbell, K., Drinkers of Hemlock: A Novel, by A. Stodart Walker. *Review* . . . 65
Cancer Problem, The . . . 481

PAGE
Cape Colony as a Health Resort for those suffering from Pulmonary Phthisis, with special reference to the Graded Altitude System, by J. A. ROBERTSON . 434
Carbolic Acid, Action of Alcohol and Glycerin as Antidotes to . 559
Cardiac Muscle, by JOHN M. COWAN 127
Carnegie Trust 295
Carter, Dr. Brudenell, and the Profession 1
Cautley, E., The Natural and Artificial Methods of Feeding Infants and Young Children. *Review* 65
Cells in Fluids, Diagnostic Value of 274
Cervix, Dilatation of the, by Bossi's Instrument in Cases of Abortion and Labour 174
CHARTERIS, F. J., Manual of Medicine, by W. H. Allchin, vol. v. *Review* 161
,, Die Therapeutischen Leistungen von Dr. A. Pollatschek. *Review* 260
,, Transactions of the Clinical Society of London, vol. xxxvi. *Rev.* 161
,, Verhandlung der achtzehnten Versammlung der Gesellschaft für Kinderheilkunde, by E. Pfeiffer. *Review* 260
Chloroma 563
Cleft Palate, On the Treatment of, by W. ARBUTHNOT LANE . . 216
Collegiate Training of Women, by T. C. SHAW 444
Conduction Anæsthesia, Experimental Observations and Experience in 172
CORNER, E. M., Thrombosis and Acute Gangrene in Strangulated Herniæ 393
Cornish Riviera 200
COWAN, JOHN M., The Cardiac Muscle 127
Cryoscopy, The Scientific Basis of 359
CUMMING, R., & J. M. BEATTIE, Lacerated Wound of the Heart . 451
Cutaneous Telangiectases and their Etiology: Comparison with the Etiology of Hæmorrhoids and Ordinary Varicose Veins, by F. PARKES WEBER . . . 346
Cyclic Albuminuria . . . 168

DAVIDSON, ANDREW, Annual Report of the Sanitary Commissioner with the Government of India for 1901. *Review* . . 163
DAVIDSON, ANDREW, Etiology and Pathology of Beriberi, by H. Wright. *Review* . . . 162
Davison, A., Mammalian Anatomy, with special reference to the Cat. *Review* 544
Death from Hæmorrhage, Diagnosis of, from the Post-mortem Appearances 560
Dench, E. A., Diseases of the Ear. *Review* 160
Diphtheria, Action of the Toxin and Antitoxin of . 275
,, Antitoxin, Best Method of using . . . 370
,, Bacilli Immunity by means of . . . 275
,, On the Branching occasionally exhibited by the 469
,, Toxin, Poison Constituents of . . . 275
DIXON, A. F., Atlas of Human Anatomy, by Toldt and Rosa. *Review* 357
DOUGLAS, C. E., The Bacteriology of Milk, by G. Newman and H. Swithinbank. *Review* . 353
,, Surgical Diseases of the Abdomen, by R. Douglas. *Review* . . 257
DRESER, H., On the Diuresis produced by Theocin in Healthy Persons 137
DUNCAN, ANDREW, The Stools of Dysentery, and the Prognostic Indications derivable from them 349
DUNLOP, G. H. M., The Natural and Artificial Methods of Feeding Infants and Young Children, by E. Cautley. *Review* . . 65
,, The Nutrition of the Infant, by R. Vincent. *Review* . . 258
Dysentery, A Comparative Study of the Bacilli of, by J. W. H. EYRE . 489
,, The Stools of, and the Prognostic Indications derivable from them, by ANDREW DUNCAN . . . 349

ECLAMPSIA, Vaginal Cæsarean Section 463
Eczema and Sudden Death in Children 561
Edinburgh, The Amenity of . . 391
,, Practical Midwifery in 292
,, Royal Infirmary, 97, 193, 194
,, The Last "K.-C." . 296

PAGE
Editorial . 1, 97, 194, 289, 385, 481
Ergot in Typhoid Fever . . . 559
Ethyl Chloride, Death during General Anæsthesia with . . . 273
Exophthalmic Goitre, Dermatoses occurring in 85
Extra-Uterine Pregnancy, Full-time, with Living Child . . . 366
EYRE, J. W. H., A Comparative Study of the Bacilli of Dysentery 489

FACIAL PARALYSIS, Treatment of, by Nerve Transplantation . 365
Female Reproductive Organs, Leucocytosis in Diseases of the . 269
Fibrinous Bronchitis, On the Etiology of, by W. T. RITCHIE . 117
Fibro-Myomata, The Association of Ovarian with Uterine, by F. E. TAYLOR 506
Fifeshire Folk-Medicine, by DAVID RORIE 513
Fluorescent Substances, Therapeutic Experiments with . . 176
Foods, The Sophistication of . 476
Fundal Suspensory Ligament after Ventro-Fixation . . . 76

GASTRIC ULCER, Treatment of . 270
Gaultheria, Poisoning with Oil of 370
General Medical Council, and its Final Examination Reports . 389
Goitre, Oily Solutions of Iodine in 369
Gonococcal Peritonitis in Young Girls 379
Gould, G. M., The Year-Book of Medicine and Surgery. *Review* 67
Granulosis Rubra Nasi. . . . 376

HÆMOLYSINS and Bacteriolysins . 82
Hæmorrhage, Spontaneous, from Both Ears, Unusual Case of . 182
Hæmorrhages, Spontaneous, in New-born Children . . . 90
Hæmorrhagic Pericarditis, associated with the presence of *B. Coli Communis*, by W. STEWART . 158
Hanging, Death by, after Tracheotomy 180
Hay Fever, Antitoxin Serum (Dunbar's) in 176
Heart Disease, The Neural Factor in, by ALEXANDER MORISON 235
,, Lacerated Wound of the, by R. C. CUMMING and J. M. BEATTIE . . 451
Hebotomy 367
Hernia, by RUTHERFORD MORISON 203, 308
,, Paraffin Injection in Treatment of . . . 171
,, Strangulated . . . 554
Hip, New Method of Reducing Posterior Dislocations of the . 268
Hunterian Lectures . . . 293
Hydrophobia, Effect of Filtration on the Virus of. . . . 468
Hydrostatic Test, The, and Putrefaction 181
Hysterectomy, Supravaginal . 556

IMMUNITY 275
India, Annual Report of the Sanitary Commissioner with the Government of, for 1901. *Review*. 163
Influenza Bacillus, Symbiosis of the 82
Inguinal Hernia, Inflammation in an Appendix in the Sac of an 365
Insanities, The Relations of, to Criminal Responsibility and Civil Capacity, by Sir J. B. TUKE and C. R. A. HOWDEN 11, 146, 244, 325, 409
Insanity, Uncertified, and certain Forms of Moral Defect . . 371
Intestine, Lipoma of the . . 264
Intravenous Medication . . 557
Iodide of Potash Eruption . . 377
Iodoform, Antiseptic Action of . 170
Irish Poor-Law Medical Service, The 385

JACKSONIAN EPILEPSY, Surgical Treatment of Non-Traumatic . . 363
,, Traumatic . . . 73
Jacobi, Portfolio of Dermochromes. *Review* 67
JAMIESON, W. ALLAN, Diseases of the Skin, by H. W. Stelwagon. *Review* 259
,, La Pratique Dermatologique, par Besnier, Brocq, et Jacquet. *Review* . . . 541
,, Portfolio of Dermochromes, by Professor Jacobi. *Review* . . . 67
Jellett, H., Short Practice of Gynæcology. *Review* 358
,, Short Practice of Midwifery. *Review* . 358
Johns Hopkins Hospital Reports, vol. xi. *Review* . . . 258

PAGE

JONES, R. L., Types of Rheumatoid Arthritis, with suggestions as to Thyroid Treatment . . . 425

KATATONIA, Contribution to the Study of 372
Experimental Observations on . . . 372
Kidney Extracts, Therapeutic Value of 271
KING, D. BARTY, The Treatment of Bronchiectasis . . . 519
Koblanck, Die Chloroforme und Aethernarkose in der Praxis. *Review* 260
Kraepelin, E., Psychiatry. *Review* 164, 545
KYNOCH, J. A. C., A Case of Cæsarean Section for Contracted Pelvis . 448
,, Short Practice of Gynæcology, by H. Jellett. *Review* . . . 358
,, Short Practice of Midwifery, by H. Jellett. *Review* . . . 358
,, Text-Book of Obstetrics, by J. C. Webster. *Review* . 354

LABORATORY TECHNIQUE . . . 85
Labyrinth, Suppuration in the, and Intracranial Infection through it 471
LANE, W. ARBUTHNOT, On the Treatment of Cleft Palate . . 216
Leredde, L. E., The Syphilitic Nature and Curability of General Paralysis and Tabes. *Review* . 66
Leucocythæmia, Recent Papers on 548
Lightning Stroke affecting a number of Persons . . . 542
Löwenfeld, L., Sexual Life and Nervous Disease. *Review*. . 356
LUKE, T. D., Die Chloroforme und Aethernarkose in der Praxis, by Dr. Koblanck. *Review* . . 260
Lumbar Puncture in Intracranial Complications 183

M'GILLIVRAY, A., The Ocular Circulation, by J. H. Parsons. *Review* 163
MACPHERSON, J., Variation in its Relation to the Origin of Insanity and the Allied Neuroses 334, 416, 529
Man, The Nature of . . . 101
Marriage and the Race . . . 199
Ménière's Disease, Quinine Hydrochloride in 80

Mercurial Nephritis . . . 273
Mesotan, Eruption from . . . 376
Middle Ear Inflammation, Lumbar Puncture in 183
MIDDLEMASS, J., Hyptnotism: its History, Practice, and Theory, by J. Milne Bramwell. *Review* . . . 355
,, Psychiatry, by E. Kraepelin. *Review* 164, 545
,, Sexual Life and Nervous Disease, by L. Löwenfeld. *Review*. 356
,, The Syphilitic Nature and Curability of General Paralysis and Tabes, by L. E. Leredde. *Review* . 66
MILES, A., Diseases of the Anus, Rectum, and Pelvic Colon, by J. P. Tuttle. *Review* . 63
,, Modern Methods in the Surgery of Paralysis, by A. H. Tubby and R. Jones. *Review* . 162
,, The Year-Book of Medicine and Surgery, edited by G. M. Gould. *Review* . 67
,, and J. C. CARR, Notes of a case of Traumatic Hæmatorrachis of the Upper Dorsal Region . . . 155
,, and J. W. STRUTHERS, Bennett's Fracture of the Base of the Metacarpal Bone of the Thumb . . . 297
Milk, The Preservation of . . 474
Moles, Treatment of Pigmentary . 86
MORISON, ALEX., The Neural Factor in Heart Disease . . 235
MORISON, RUTHERFORD, Abdominal and Pelvic Surgery . 21
,, Hernia . . . 203, 308
Myomata, Sarcomatous Transformation of 556

NEWMAN, G. and H., Swithinbank, The Bacteriology of Milk. *Review* 353
Notes on Books . 69, 164, 261, 546

Obituary—
Cunynghame, R. J. B. . . 285
Leitch, Deputy-Surgeon-General 286
Murray, R. Milne . . . 287
Thompson, Sir Henry . . 480

PAGE
Oesophagus, Diseases of the . . 454
Oöphorectomy in Irremovable Cancer of the Breast . . . 73
Ophthalmology, Tenth International Congress of . . . 202
Optic Neuritis in Acute Infectious Diseases 564
Osteomyelitis, Agglutination Reaction in 82
Ovarian Pregnancy . . . 76
,, Two Cases of . . 367
,, Tumours, Blood Examination in . . 464
,, Torsion of the Pedicle in 464

PARAMETRIUM, Fœtal Head in the 464
Parsons, J. H., The Ocular Circulation. *Review* . . . 163
Patella, Recurrent Dislocation of . 460
Pelvic Inflammation . . . 173
Pericardium, Tapping the . . 80
Perineal Prostatectomy, Results from 170
Perineum, Secondary Suture of the, during the Puerperium . 269
Perityphlitis, the Value of Leucocyte Estimations in . . . 462
Pfeiffer, E., Verhandlung der achtzehnten Versammlung der Gesellschaft fü Kinderheilkunde. *Review* 260
Phthisis, Intratracheal Injections in 466
Physical Culture 387
Placenta Prævia 463
Pneumonia, Venesection in . . 558
Pollatschek, A., Therapeutischen Leistungen. *Review* . . 260
Poor Law Medical Officers, the Position of . . 289
,, Service, Irish . . 385
Potassium Iodide Idiosyncrasy . 371
Potato Salad, Poisoning by . . 563
Precancerous Keratoses . . 86
Pre-Sacral Tumour, Labour Obstructed by 367
Prostate, On so-called Spontaneous Hæmorrhage from . . . 552
Prostatic Hypertrophy, the Surgical Problem in 72
Psoriasis, Histo-Pathogenesis of . 88

RADIUM, Action of, on the Agglutinating Property of the Blood of Typhoid Patients . . . 469
,, Mode of using . . 87
RANKIN, GUTHRIE, Arterial Degeneration 402
Rectorial Disturbances . . . 197

PAGE
Recent Advances in Medical Science—
Dermatology, by W. ALLAN JAMIESON 85, 373
Diseases of Children, by G. H. MELVILLE DUNLOP . 89, 378
Diseases of the Ear, Nose, and Throat, by P. M'BRIDE and A. LOGAN TURNER . 182, 471
Diseases of the Eye, by GEORGE A. BERRY and W. G. SYM 278, 563
Insanity, by Sir JOHN BATTY TUKE and JOHN MACPHERSON 371
Medical Jurisprudence, by HARVEY LITTLEJOHN . . 178, 560
Medicine, by A. LOCKHART GILLESPIE 71, 166, 262, 359, 454, 548
Obstetrics and Gynæcology, by F. W. N. HAULTAIN and J. A. C. KYNOCH 75, 173, 268, 366, 463, 555
Pathology and Bacteriology, by R. F. C. LEITH . 81, 274, 468
Public Health, by J. BUCHANAN YOUNG 185, 474
Red Blood Cells, A Study of the Volume of the, in various Diseases 469
Surgery, by ALEXANDER MILES 72, 170, 265, 363, 458, 552
Therapeutics, by RALPH STOCKMAN and FRANCIS J. CHARTERIS . 78, 175, 270, 368, 465, 557

Reports of the Medical Societies—
Edinburgh Medico-Chirurgical Society . 93, 189, 281, 381, 566
Edinburgh Obstetrical Society . 191, 282, 478, 567
Forfarshire Medical Association . 96, 284, 479
Glasgow Medico-Chirurgical Society 95, 192, 283, 382, 478, 567
Glasgow Pathological and Clinical Society 95, 191, 284, 383, 479, 568
Rheumatism, Causes, Pathology, and Treatment of Chronic, by RALPH STOCKMAN . . 107, 223
Rheumatoid Arthritis, Eye Symptoms in . . . 565
,, Types of, with Suggestions as to Thyroid Treatment, by R. L. JONES . . . 425
RITCHIE, W. T., On the Etiology of Fibrinous Bronchitis 117
,, Text-Book of the Practice of Medicine, by J. M. Anders. *Review* . 544
ROBERTSON, J. A., Cape Colony as a Health Resort for those suffering from Pulmonary Phthisis, with special reference to the Graded Altitude System 434

PAGE

Röntgen Rays, Effects of . . . 177
RORIE, D., Some Fifeshire Folk-Medicine 513
Royal Army Medical Corps and Lord Esher 485

SALIT 557
Salivary Glands, Mixed Tumours of 461
Scarlatina, when should a Strict Milk Diet be stopped in ? . . 467
Scientific Composition 487
Scopolamine and Morphia, Narcosis with 175
Secretine 368
Sewage, Pollution of Soil by . 185
SHAW, T. C., The Collegiate Training of Women . . . 444
Shoulder Joint, Arthrodesis of the 267
Skull, Osteomyelitis of the, with Empyema of the Nasal Accessory Sinuses 184
Speech Defects in Mentally Deficient Children 378
Spencer, Herbert 6
Spermatic Cord, Torsion of the . 365
Splenectomy, Influence of, on the Leucocytes of the Blood in the Dog 274
STELWAGON, H. W., Diseases of the Skin. *Review* . . . 259
STEWART, W., Hæmorrhagic Pericarditis associated with the presence of *B. Coli Communis* . 158
STOCKMAN, RALPH, Causes, Pathology, and Treatment of Chronic Rheumatism 107, 223
Stovaine, a new Local Anæsthetic 558
STRUTHERS, J. W., The Johns Hopkins Hospital Reports, vol. xi. *Review* 258
Sudden Death 560
Summer Diarrhœas of Infants, Bacteria in 91
Suprarenal Bodies, Diseases of the 262

TAPEWORM, The Dwarf . . . 71
TAYLOR, F. E., The Association of Ovarian with Uterine Fibro-Myomata 506
Teeth, Extraction of, under Chloroform 196
Temperature in its Relation to Shock 171
Theocin 559
,, On the Diuresis produced by, in Healthy Persons, by H. DRESER . . . 137
Thrombosis and Acute Gangrene in Strangulated Herniæ, by E. M. CORNER 393

PAGE

Thyroid, Excision of, during Pregnancy 75
Toldt and Rosa, Atlas of Human Anatomy. *Review* . . . 357
Transactions of the Clinical Society of London, vol. xxxvi. *Review* . 161
Trauma, Influence of, in the Production of Movable Kidney . 460
Traumatic Hæmatorrachis of the Upper Dorsal Region, by A. MILES and J. C. CARR . . . 155
Trendelenberg Position, Dangers of the 171
Tubby, A. H., and R. Jones, Modern Methods in the Surgery of Paralysis. *Review* . . . 162
Tuberculosis, Administrative Measures against 186
Tuberculous Peritonitis in Children . . . 90
,, Medical Treatment of . 79
TUKE, Sir J. B., and C. R. A. HOWDEN, The Relations of the Insanities to Criminal Responsibility and Civil Capacity 11, 146, 244, 325, 409
TURNER, A. L., A Contribution to the Pathology of "Bone Cysts" in the Accessory Sinuses of the Nose . . . 47
,, Diseases of the Ear, by E. A. Dench. *Review* 160
Tuttle, J. P., Diseases of the Anus, Rectum, and Pelvic Colon. *Review* 63
Typhoid Bacillus in the Lungs of Typhoid Fever Cases 81
,, Fever, Ergot in . . . 559
,, Intestinal Perforation in 265
,, Propagation of, by Butter 277
,, Toxin and Antitoxin, Action of 276

ULNAR NERVE, Recurrent Dislocation of 74
Urethritis, Treatment of Chronic. 552
Urethrotomy, Internal . . . 363
Uric Acid, Influence of Chinic Acid on the Elimination of . 79
Urine, Treatment of Nocturnal Incontinence of, by Retrorectal Injections of Saline Solution . 266
Uterine Carcinoma and Vaginal Operation 555
Uterus, Bacteriology of the Puerperal . . 77
,, Combination of Carcinoma and Tuberculosis of the . . 465

PAGE

Uterus, Retroversion of the . . 268
,, Vaginal total Extirpation of, for Myomata . 556

Vaginal Cæsaran Section, Technique of . . . 366
,, Drainage, Advantages of 465
,, Operations without Narcosis . . 75

Variation in its Relation to the Origin of Insanity and the Allied Neuroses, by J. Macpherson . . 334, 416, 529
Varicocele, A New Operation for 74
Vegetables, Digestibility of . . 368
Vincent, R., The Nutrition of the Infant. *Review* . . . 258

Walker, A. Stodart, Drinkers of Hemlock : A Novel. *Review* . 65

PAGE

Water, Quantitative Bacteriological Examination of . . 274
Weber, F. Parkes, Cutaneous Telangiectases and their Etiology ; Comparison with the Etiology of Hæmorrhoids and Ordiary Varicose Veins . . . 346
Webster, J. C., Text-Book of Obstetrics. *Review* . . . 354
Whooping-Cough, Paroxysms of, treated by pulling the Lower Jaw downward and forward . 89
Word-Blindness, Congenital . 279
Wright, H., An Inquiry into the Etiology and Pathology of Beriberi. *Review* 162

X-Rays, A Suggestion regarding the Nature and Character of the 375

41A
373+

3 2044 103 055 16